

Countering The Non-State Nuclear Threat: Are We Ready?

CSC 2005

Subject Area National Security

***COUNTERING THE NON-STATE NUCLEAR THREAT:
ARE WE READY?***

SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF MILITARY STUDIES

**CHRISTOPHER T. CABLE
MAJOR USMC**

AY 04-05

Report Documentation Page				Form Approved OMB No. 0704-0188	
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE 2005		2. REPORT TYPE		3. DATES COVERED 00-00-2005 to 00-00-2005	
4. TITLE AND SUBTITLE Countering The Non-State Nuclear Threat: Are We Ready?				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) United States Marine Corps,Command and Staff College, Marine Corps University,2076 South Street, Marine Corps Combat Development Command,Quantico,VA,22134-5068				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 63	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

DISCLAIMER

THE OPINIONS AND CONCLUSIONS EXPRESSED HEREIN ARE THOSE OF THE INDIVIDUAL STUDENT AUTHOR AND DO NOT NECESSARILY REPRESENT THE VIEWS OF EITHER THE MARINE CORPS COMMAND AND STAFF COLLEGE OR ANY OTHER GOVERNMENTAL AGENCY. REFERENCES TO THIS STUDY SHOULD INCLUDE THE FOREGOING STATEMENT.

QUOTATION FROM, ABSTRACTION FROM, OR REPRODUCTION OF ALL OR ANY PART OF THIS DOCUMENT IS PERMITTED PROVIDED PROPER ACKNOWLEDGEMENT IS MADE.

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

Title: Countering the Non-State Nuclear Threat

Author: Major C. T. Cable, United States Marine Corps

Thesis: This paper examines terrorist organizations seeking nuclear capabilities, nuclear material availability, and the international policies promoted by the Administration in an effort to stop transnational nuclear terrorism. It will show that the Administration clearly understands the threat, has addressed it within the National Security Strategies, and has implemented international programs attempting to secure our nation. Finally, it will argue that the task of securing this nation from a nuclear terrorist strike is far from complete and time is running out.

Discussion: The possibility of nuclear terrorism is growing. Terrorist groups are becoming more sophisticated and the lethality of their actions are increasing. Fueled by a myriad of religious, social, and political agendas nuclear weapons may be considered by extremists as an intimate part of an asymmetric threat concept necessary to counter US political, economical, and military advantages.

Experts have long played down the nuclear terrorist threat due to the difficulty of acquiring and assembling a functional nuclear weapon capable of being transported. However, after September 11, 2001 the problems presented by nuclear thieves, unsecured nuclear arms, unemployed nuclear scientists, and emerging nuclear states, have become of primary concern to national security.

A review of the National Security Strategy and the National Strategy to Combat WMD demonstrates the Bush Administration's full recognition of the terrorist nuclear threat facing the American people. However, recognizing and defeating it are two different issues. An examination of the Proliferation Security Initiative (PSI), United Nations Security Resolution 1540, and the Group of Eight (G8) countries expansion of the Nunn-Lugar Legislation highlight the successes and shortcomings of current initiatives implemented by the administration.

To prevent an apocalyptic terrorist strike much more work needs to be done internationally. There must be a tremendous push for all countries to be made aware of the worldwide effects of a nuclear terrorist strike. The United Nations needs to take this threat seriously and re-evaluate the IAEA's role in nuclear policing, and finally an international sharing of intelligence must be established to focus on stopping the terrorist before they strike.

Conclusion: There is simply no quick solution that will prevent terrorists from acquiring and detonating a nuclear device. To insinuate otherwise is to base our defense upon hope. However, by increasing participation in the political arena international vulnerabilities will become exponentially harder for the terrorist to exploit. With a specialized intelligence organization linked to a UN backed anti-nuclear quick reaction force, terrorists bent on nuclear destruction will find themselves attacking a unified global defense.

TABLE OF CONTENTS

MMS COVER SHEET	i
DISCLAIMER.....	ii
EXECUTIVE SUMMARY	iii
I. INTRODUCTION.....	1
II. REASONS FOR SEEKING NUCLEAR ARMS	2
III. THE INTENT.....	4
IV. ACQUIRING THE MEANS.....	7
A. The Russian Security Problem.....	7
B. Civilian Nuclear Sources.....	10
C. The “Brain Drain”	13
V. US POLICY ON NUCLEAR WEAPONS.....	14
A. The National Security Strategy and Nuclear Terrorism.....	15
B. The National Strategy to Combat Weapons of Mass Destruction and Nuclear Terrorism.....	17
i. Counter-proliferation.....	18
ii. Nonproliferation.....	19
iii. WMD Consequence Management.....	20
VI. CURRENT US POLICIES.....	21
A. The Proliferation Security Initiative.....	21
B. United Nations Security Resolution 1540.....	26
C. Nunn-Lugar Legislation and the G8 Global Partnership.....	30
VII. WHERE DO WE GO FROM HERE.....	35
A. Political Push for Education.....	36
B. Strengthening the IAEA	37
C. International Intelligence.....	39
VIII. CONCLUSION.....	39
APPENDIX A: SUMMARY OF EFFECTS FROM TERRORIST NUCLEAR DETONATION.....	41
APPENDIX B: PROLIFERATION SECURITY INITIATIVE: STATEMENT OF PRINCIPLES.....	48

APPENDIX C: UNITED NATIONS SECURITY RESOLUTION 1540.....	50
BIBLIOGRAPHY	54

I. INTRODUCTION

History will judge harshly those who saw this coming danger but failed to act.¹
-President G.W. Bush

Brussels: just outside of the NATO Headquarters, catastrophe lurked in the shadows. In a flash, forty thousand people were incinerated. Almost immediately, surviving hospitals were flooded with hundreds of thousands of injured and burned. Panic ripped through Europe, plunging the world economy into chaos. More than fifty people from fifteen countries, as well as representatives from NATO, the International Atomic Energy Agency, and Interpol stood quietly in shock as the devastation of the computer simulation set in. Al-Qaeda had just successfully detonated a crude nuclear device outside of NATO headquarters in a simulation constructed with the assistance of the Center for Strategic and International Studies.² The most frightening part of the simulation was the reality of this modern threat. With improperly secured nuclear materials spread around the world, and terrorists actively seeking nuclear capabilities, the probability of just such an attack grows daily. The Bush Administration initiated the War on Terror and created the Department of Homeland Security to combat terrorism directly in the hope of eradicating this enemy. This paper will examine terrorist organizations seeking nuclear capabilities, nuclear material availability, and the international policies promoted by the Administration in an effort to stop transnational nuclear terrorism. It will show that the Administration clearly understands the threat, has addressed it within the National Security Strategies, and has implemented international programs attempting

¹President George W. Bush, *National Strategy to Combat Weapons of Mass Destruction*, December 2002, 1.

² "NATO Simulates Al-Qaeda Nuclear Attack," *Associated Press*, 4 May 2004,
URL: <<http://www.foxnews.com/story/0,2933,118975,00.html>> accessed 19 December, 2004.

to secure our nation. Finally, it will argue that the task of securing this nation from a nuclear terrorist strike is far from complete and time is running out.

II. REASONS FOR SEEKING NUCLEAR ARMS

*What does seem beyond doubt is that acquiring the capability to explode a nuclear device must certainly be very appealing for any terrorist group seeking to cause major damage to society and the governmental and social institutions they oppose.*³

The possibility of nuclear terrorism is growing. Terrorist groups are becoming more sophisticated and the lethality of their actions is increasing. Theorists argue that as the US increases its efforts to eliminate terrorists, the latter in turn will devise ways to increase the lethality of their attacks. This would prompt the US and allies to escalate their efforts, thus producing a self-feeding cycle of violence, which could drive the terrorists to utilize every means available in order to shock the world, including a nuclear detonation. In essence, nuclear weapons may be considered by extremists as an intimate part of an asymmetric threat concept necessary to counter US political, economical, and military advantages. However, there are reasons other than theory that motivate terrorists.

The religious prominence in many of these terrorist factions is of serious concern. In the light of the September 11th attacks on the World Trade Center and the Pentagon, the emphasis of political expression seems to have taken a back seat to religious fervor. As two analysts have noted, "Extreme Islamic groups view the world through a radical lens, interpreting their religion as encouraging the use of any means possible to destroy

³ Jeffery Boutwell, Fancesco Calogero and Jack Harris, "Nuclear Terrorism: The Danger of Highly Enriched Uranium," *Pugwash Issue Brief*, Vol. 2, no. 1, September 2002.
URL:<<http://www.pugwash.org/publication/pb/sept2002.pdf>>, accessed 5 December 2004, 2.

the Infidel.”⁴ Ironically, the more zealous these groups become the farther they seem to drift away from their holy scripture, the Koran, which is generally accepted as forbidding such extreme violence. Yet, In the hands of the extremists, the Koran may be reinterpreted to justify horrific bloodshed. Under such interpretations, religion can serve as a “legitimizing force,” which reduces moral inhibitions that normally block mass casualties.⁵ “Experts believe that religion-based terrorist groups are among the most likely to seek weapons of mass destruction.”⁶ These hyper-religious agendas constitute the most dangerous motivator driving possible nuclear implementation.

All terrorist groups have social and political aspirations, from the establishment of a Palestinian state to the destruction of the American lifestyle. However, terrorists, unlike more peaceful political movements, perpetrate violence in order to obtain objectives. While optimists express doubt that political and social aspirations could result in nuclear implementation, one thing almost everyone agrees on is that the threat of a nuclear detonation becomes a serious extortion tool when dealing with legitimate governments. It immediately provides even the small extremist groups undeniable access to a seat at the political roundtable. The danger is that if an extremist group threatens to go nuclear, even if a government believes it to be a bluff, the perceived sense of security clung to by optimists erodes quickly. Conceivably, the mere possession of nuclear weapons could embolden the terrorist group and encourage extreme risk taking.⁷ In

⁴ Jay Ackerman and Laura Snyder. “Would They if They Could?” *Bulletin of the Atomic Scientists*, Vol. 58, no. 3, (May /June 2002): URL: <http://www.thebulletin.org/article.php?art_ofn=mj02ackerman> accessed 16 December 2004.

⁵ Bruce Hoffman, *Inside Terrorism* (New York: Columbia University Press, 1998), 94.

⁶ Jay Ackerman and Laura Snyder. “Would They if They Could?” *Bulletin of the Atomic Scientists*, Vol. 58, no. 3, (May /June 2002): URL: <http://www.thebulletin.org/article.php?art_ofn=mj02ackerman> accessed 16 December 2004.

⁷ Martin Schram, *Avoiding Armageddon: Our Future, Our Choice* (New York: Basic Books, 2003), 6.

short, the relationship between nuclear weapons and terrorism is entering a new phase in history. They are now weapons to be used to exploit weaknesses in US political will.

Finally, even the possibility of a credible nuclear detonation within the US could disrupt the US economy, sending the country reeling. Whether created by the actual detonation, or just by the threat of one, the US lifestyle would be changed forever. In terms of extremists groups like Al-Qaeda, this is exactly what the terrorist seek. The ability to completely disrupt the “infidel fortress” would empower the terrorist, increase recruiting, and strike fear into lesser countries designated as enemies of their cause. The United States in particular represents the greatest target available. If the falling of the Twin Towers which killed just under 2,800 people can bring people cheering into the streets of certain Middle Eastern countries, imagine the power generated world-wide from killing 60,000 Americans. The United States has enemies. These enemies see the United States as the source of their problems and would stop at nothing, not even nuclear detonation, to strike at it.

III. THE INTENT

The threat of nuclear terrorism is real and daunting. While currently terrorists have not acquired, much less employed, a nuclear weapon, they are clearly intent on causing mass casualties. Examples repeatedly crossing the news tickers serve to remind us that these groups are bent on massive destruction.

In 1995, a Japanese cult called Aum Shinrikyo released sarin in the Tokyo Subway system. While poorly distributed, 12 people died and 5,000 were sent to hospitals.⁸ If properly released via aerosol form, this gas, which is 500 times more toxic

⁸ “Terrorism Questions and Answers,” Council of Foreign Relations. Updated May 2004, URL: <http://www.cfrterrorism.org/weapons/sarin.html>, accessed 10 December 2004.

than cyanide, could have killed 10,000 to 20,000 people.⁹ On April 27, 2004, the World News reported that Jordan's intelligence department in Amman had successfully thwarted a chemical attack. In this instance, Al-Qaeda terrorist Abu Musab Al-Zaqawi intended to detonate 20 tons of chemicals loaded onto the back of trucks. Estimates indicate that if successful, the human loss could have reached 80,000, with another 160,000 people injured.¹⁰

While these examples utilized chemical weapons, the desire to go nuclear is documented and foreboding. The destruction capability of a nuclear device varies dramatically based upon type and quantity of nuclear material and method of detonation. Using calculations based upon a small device of 1-kiloton magnitude, Appendix A. uses Central Park and Manhattan, New York to illustrate how devastating a nuclear detonation, in lieu of the previously mentioned chemical attacks, could have been. Currently, the terrorist have been unable to turn intent into a credible nuclear threat. However, the possibility is real and needs to be understood. There is no doubt, for example, that Al-Qaeda is working to develop nuclear capabilities. Since the 1990's, intelligence communities have documented testimonies lending credibility to efforts of Al-Qaeda to acquire nuclear materials. Case in point, in 1998, Mamdouh Mahmud Salim, an Al-Qaeda operative, was arrested for attempting to purchase "enriched uranium" in Munich, Germany.¹¹ Another Al Qaeda member, Jamal Ahmad al-Fadl, a Sudanese operative, testified to the US District Court in US v. Usama Bin Laden that he

⁹ U.S. Congress, Senate Government Affairs Permanent Subcommittee on Investigations, *Global Proliferation of Weapons of Mass Destruction: A Case Study on the Aum Shinrikyo*, Staff Statement, 31 October 1995, URL:<[http:// www.fas.org/irp/congress/1995_rpt/aum/](http://www.fas.org/irp/congress/1995_rpt/aum/)>, accessed 11 November 2004.

¹⁰ "Jordan Foiled Al-Qaeda Chemical Attacks," *World News, Agence France-Presse*, 27 April 2004. URL: <http://www.inq7.net/wnw/2004/apr/28/wnw_1-1.htm>, accessed 12 December, 2004.

¹¹ Benjamin Weiser, "U.S. Says Bin Laden Aide Tried to Get Nuclear Weapons," *New York Times*, 26 September 1998, Final Ed., A3.

had actively assisted Bin Laden by attempting to acquire nuclear materials.¹² Most recently, Time reported that Sharif al-Masri, an Egyptian Al-Qaeda operative captured in Pakistan near its Iranian and Afghanistan border, knew of Al-Qaeda plans to “smuggle nuclear materials to Mexico, then [Al-Qaeda] operatives would carry the materials into the United States.”¹³ The depth of this threat is not confined to Al-Qaeda. The previously mentioned Aum Shinrikyu has also crossed the nuclear acquisition threshold. Driven by their intent to bring about a war with the United States and, thus Armageddon, they allegedly tried to purchase nuclear weapons from Russia.¹⁴

Emboldened by the success of September 11, terrorist groups are examining ways of escalating the grandeur of their attacks. As recently as June 15, 2004, the Washington Times published an article quoting British Intelligence sources saying that after September 11, “Bin Laden’s suicide-attack philosophy had changed the calculus of the threat...[the terrorist] now sought to cause casualties on a massive scale.”¹⁵ This shift has intelligence agencies worldwide in a scramble to stay ahead of the next impending disaster. Clearly, the intent to utilize weapons of mass destruction, coupled with the attempts to obtain nuclear capabilities, frames the danger hiding in these groups.

¹² Jack Boureston, “Assessing Al Qaeda’s WMD Capabilities,” *Strategic Insights: Journal for the Center of Contemporary Conflict*, Vol.1, Issue 7, (September 2002), URL: < <http://www.ccc.nps.navy.mil/si/sept02/wmd.asp#references>>, accessed 10 December 2004.

¹³ Adam Zargorin and Syed Talat Hussain, “Bordering on Nukes,” *Time*, 22 November, 2004. URL:<<http://www.time.com/time/archive/preview/0,10987,995684,00.html>> accessed 09 December 2004.

¹⁴ David Albright, Kevin O’Neill, and Corey Hinderstien. “Nuclear Terrorism: the Unthinkable Nightmare,” Issue brief delivered to the Institute for Science and International Security, 13 September 2001. URL: <http://www.isis-online.org/publications/terrorism/nightmare.html>> accessed 5 December 2004.

¹⁵ Bill Gertz, “British Reports Links to Al-Qaeda, Baghdad.” *Washington Times*, 15 June 2004. URL:<<http://www.washtimes.com/national/20040715-121130-6893r.htm>> accessed 5 January 2005.

IV. ACQUIRING THE MEANS

*The most urgent unmet national security threat to the United States today is the danger that...weapons- usable material in Russia could be stolen, sold to terrorist...and used against American troops abroad or citizens at home.*¹⁶

If you take a little piece of nuclear material every now an again, you may end up with...a quantity which may be feasible to make a warhead from
-an International Atomic Energy Agency official¹⁷

Experts have long played down the nuclear terrorist threat due to the difficulty of acquiring and assembling a functional nuclear weapon capable of being transported. However, what constituted backstage concerns took center stage by September 11, 2001. It is clear now that terrorist have plans aimed at huge carnage. Therefore, the problems presented by nuclear thieves, unsecured nuclear arms, unemployed nuclear scientists, and emerging nuclear states, become of primary concern to national security, since these problems present the principal means by which terrorists might steal or purchase the nuclear material necessary for a bomb.

A. The Russian Security Problem

Point blank, Russian nuclear materials are too vulnerable. With terrorists actively seeking weapons-grade nuclear material the illicit spread of weapons-usable plutonium or highly-enriched uranium out of Russia and onto the international black market, constitutes a major risk. When the Berlin Wall fell, the Soviet Union had an estimated 30,000 nuclear weapons and 650 metric-tons of weapons grade nuclear material.¹⁸ Today about 10,000 warheads are still on active duty while another 10,000 are being held in

¹⁶ Robert L. Civiak, "Closing the Gaps: Securing High Enriched Uranium in the Former Soviet Union and Eastern Europe," URL: <www.fas.org/ssp/docs/020500-heu/intro.htm>, accessed 5 December 2004.

¹⁷ Schram, 3.

¹⁸ Physicians for Social Responsibility, "Reducing the Threat of Nuclear Terrorism: Nonproliferation Efforts in the U. S. State Department," Issue brief, August 2002.
URL:<http://www.psr.org/home.cfm?id=dos_brief> accessed 10 December 2004.

reserve or awaiting breakdown. While the approximately other 10,000 have been dismantled, most of the nuclear material is in storage in one of more than sixty sites. Thirty-two of these sites have more than one hundred kilograms of highly-enriched plutonium or uranium, some storing amounts measured in tons.¹⁹ Since the Standing Advisory Group on Safeguards Implementation (SAGSI) of the IAEA, determined the approximate quantity of nuclear material needed to manufacture a nuclear explosive device to be 17.6 lbs of plutonium, 55.1 lbs of contained U-235 highly enriched uranium (HEU), or 165.3 lbs of contained U-235 low-enriched uranium (LEU), the lack of security surrounding these storage facilities poses a severe threat to national security.²⁰ Even more frightening is a 1995 study by the National Resource Defense Council which concluded “that terrorists with ‘low’ technical ability could build a small nuclear weapon with about nine pounds of plutonium or 20 pounds of highly enriched uranium.”²¹

The inability to secure the Soviet nuclear facilities still plagues policy makers today. While Moscow manages to maintain adequate security and control of its nuclear weapons against external threats, it has failed to address the most dangerous threat faced today: the insider who steals undetected small amounts and over time accumulates a stockpile worthy of attracting the attention of potential buyers.²² There are documented cases highlighting the failures in Russian security:

¹⁹ Robert L. Civiak, “Closing the Gaps: Securing High Enriched Uranium in the Former Soviet Union and Eastern Europe,” URL: <www.fas.org/ssp/docs/020500-heu/intro.htm>, accessed 5 December 2004.

²⁰Marvin M. Miller, Department of Nuclear Engineering Massachusetts Institute of Technology, “Are IAEA Safeguards on Plutonium Bulk-Handling Facilities Effective?” *The Nuclear Control Institute*, August 1990, URL: <<http://www.nci.org/nuketerror.htm>>, accessed 10 December 2004.

²¹Peter Eisler, “Fuel For Nuclear Weapons Is More Widely Available”, *USA Today*, 26 February 2003, URL: <http://www.usatoday.com/news/world/2003-02-26-nuke-threat-cover_x.htm> accessed 28 December 2004.

²²National Intelligence Council, “Annual Report to Congress on the Safety and Security of the Russian Nuclear Facilities and Military Forces,” February 2002, URL:<http://www.cia.gov/nic/special_russiannucfac.html> accessed 17 December 2004.

- In 1992, 1.5 kilograms of 90 percent enriched weapons-grade uranium were stolen from the Luch Production Association.
- In 1994, 3.0 kilograms of 90 percent enriched weapons-grade uranium were stolen from Moscow.
- In 1998, “sufficient material to produce an atomic bomb” was stolen from Chelyabinsk Oblast. This case remains the only nuclear theft to be described as such.²³

While these cases illustrate the concerns associated with Russia’s immense arsenal, other countries have also failed to secure their facilities from theft.

The International Atomic Energy Agency has reported 175 cases of nuclear material trafficking since 1993. In all cases the material was recovered. However, back at the nuclear facilities from where the nuclear material was stolen, records indicated that nothing was missing.²⁴ The amounts stolen were too small to be documented. This raises the disturbing unanswerable question: how much material has already been stolen and gone undetected? Referencing Russia’s problem, Central Intelligence Agency analysts have assessed “That undetected smuggling has occurred, although we do not know the extent or the magnitude of the undetected thefts. Nevertheless, we are concerned about the total amount of material that could have been diverted over the last 10 years.”²⁵

The ability for terrorists to gain access to the weapons-grade fissile material is generally understood to be the greatest obstacle in acquiring nuclear capabilities. However, nuclear material leakage is underway without any way to confidently secure it.

²³ National Intelligence Council, “Annual Report to Congress on the Safety and Security of the Russian Nuclear Facilities and Military Forces,” February 2002, URL:<http://www.cia.gov/nic/special_russiannucfac.html> accessed 17 Dec 2004.

²⁴ Schram, 10.

²⁵ National Intelligence Council, “Annual Report to Congress on the Safety and Security of the Russian Nuclear Facilities and Military Forces,” February 2002, URL:<http://www.cia.gov/nic/special_russiannucfac.html> accessed 17 Dec 2004.

The longer this vulnerability continues to go unsolved the better terrorists actively seeking fissile materials will become at exploiting it. With the acquisition obstacle removed, the terrorist will have defeated the primary defense relied on by the optimists.

B. Civilian Nuclear Sources

More separated plutonium has been produced in civilian than military nuclear programs worldwide. Unless commercial reprocessing of spent fuel is halted, there will be nearly twice as much weapons-usable plutonium in the civilian than military programs by the end of the decade.

-Paul Leventhal, President of the Nuclear Control Institute²⁶

The ability for a non-state actor to acquire fissile material is not confined to pirating aging military stockpiles. There are two types of fissile material that may be used to construct a nuclear device: plutonium and uranium. Both are available within the civilian nuclear sector, which opens another pathway for terrorists seeking nuclear power. Today, as more countries turn toward nuclear power, technology, and resources it becomes increasingly harder to ensure the security of civilian nuclear materials. This produces a proliferation dilemma. Nuclear power creates tremendous opportunities for emerging nations. However, if these nations are unable to secure their facilities and spent fuel, they become a liability to the rest of the world. To the non-state extremist such facilities and improperly stored spent fuels open another opportunity to acquire nuclear capabilities. The civilian reprocessing of spent fuels, for example, can be utilized to complete the fuel cycle by turning spent fuel back into power-producing material, and it is estimated that reprocessing activities to date have created large stockpiles of civilian plutonium. As some experts have noted the “worldwide use of nuclear power has

²⁶ Nuclear Control Institute, “IAEA’s Acknowledgement of Nuclear Terrorism Risk is Welcome but Long Overdue.” Press Release 1 November 2001, URL: <www.nci.org/01nci/10/iaea-ackn.htm> accessed 20 December 2004.

amassed more than 1,000 metric tons of plutonium in spent nuclear fuel.”²⁷ In order to understand the gravity of this threat it is imperative to understand the capabilities that reprocessed spent fuel represents.

Clearly, non-state actors seeking nuclear capability would ideally desire to acquire weapons-grade material. Yet the material extracted from civilian reactors does not meet those requirements. Termed reactor-grade, this material is still capable of producing a powerful chain reaction. During the extended irradiation process in a typical commercial power plant, plutonium continues to absorb neutrons, transforming weapons grade plutonium-239 (Pu-239) into other isotopes, including Pu-240, Pu-241, and Pu-242. In order to be considered weapons grade plutonium, it must contain less than six percent Pu-240 and even smaller percentages of Pu-241 and Pu- 242.²⁸ These isotopes degrade the bomb characteristics because they emit more neutrons through spontaneous fission and also release more heat than Pu-239. Nevertheless, according to experts, “Although the greater heat emissions would complicate the engineering of the weapon, this problem is easily surmountable.”²⁹ It is mistaken to assume that this material is unusable in the development of a bomb, although the composition of the reactor-grade plutonium increases the possibility of premature detonation, potentially resulting in a “fizzle” bomb. This would result in a smaller explosive yield than a bomb made of weapons-grade material. Yet even a reactor-grade bomb is still quite capable of producing an explosive yield. In fact, according to one expert,

²⁷ Charles D. Ferguson, “Risks of Civilian Plutonium Programs” brief for the Center of Nonproliferation Studies. July 2004. URL: <http://www.nti.org/e_research/e3_52b.html> accessed 22 December 2004.

²⁸ Charles D. Ferguson, “Risks of Civilian Plutonium Programs” brief for the Center of Nonproliferation Studies. July 2004. URL: <http://www.nti.org/e_research/e3_52b.html> accessed 22 December 2004.

²⁹ Charles D. Ferguson, “Risks of Civilian Plutonium Programs” brief for the Center of Nonproliferation Studies. July 2004. URL: <http://www.nti.org/e_research/e3_52b.html> accessed 22 December 2004.

Although states would not be inclined to use reactor-grade plutonium, because the explosive yield is unreliable from a military standpoint, terrorists seeking to build and detonate improvised nuclear devices would probably just be interested in producing any yield.³⁰

The primary outcome of any nuclear-based terror attack would be to strike fear in the public by preying upon its greatest nightmare: a nuclear detonation. Reactor-grade plutonium offers this capability even though it may not be the most desired material in the commercial world.

Highly enriched uranium (HEU) exists as the easiest of nuclear materials for terrorists trying to manufacture a weapon. Unlike plutonium, uranium may be used in the most technologically-basic nuclear weapon, like the one used on Hiroshima. HEU refers to uranium that has been processed to increase the proportion of one isotope uranium-235 (U-235) from the naturally occurring .7 percent to the 20 percent or more required for weapons usage.³¹ Weapons-grade HEU is considered to be enriched 90 percent or more. HEU is used in about 135 research reactors worldwide, spanning dozens of countries, many of which are surrounded by academic or industrial centers. Low-enriched uranium (LEU) contains less than 20 percent U-235 and is not categorized as weapons-usable under US or international standards. Therefore, inspection criteria are more lax and there is even more leeway for missing material than in a plutonium or HEU reactor. However, in 1998 a scientist at Los Alamos National Laboratory secretly designed a LEU nuclear device. The result was a yield considerably weaker than a comparably sized HEU device but still capable of destroying one square mile of any

³⁰ Charles D. Ferguson, "Risks of Civilian Plutonium Programs" brief for the Center of Nonproliferation Studies. July 2004. URL: <http://www.nti.org/e_research/e3_52b.html> accessed 22 December 2004.

³¹ Charles D. Ferguson and William C. Potter, *The Four faces of Terrorism* (Monterey: Center for Nonproliferation Studies, 2004), 116.

city.³² These civilian sources provide terrorists with potential sources free from military security. The accountability in some cases is also less stringent, and security in some of these countries is non-existent. Such sources of nuclear material pose a grave threat and an almost unending potential supply line for terrorists having the intent.

C. The “Brain Drain”

It's the brain drain that I am more worried about, and where people [the scientists] who no longer have the wherewithal to be supported may end up.
-CIA Director George Tenet, 3 February 2000³³

The concern surrounding nuclear theft is growing quickly. In nuclear countries with economic instability, workers with access to nuclear materials become easy targets for extortion. Receiving payoffs to steal very small amounts of plutonium or uranium may entice even the most loyal workers when faced with trying to feed a family. Underpaid scientists, engineers, and even military personnel with access to nuclear storage facilities represent a dangerous vulnerability to fissile material trafficking. In a study prepared by Russian social scientist Valentin Tikhonov for the Carnegie Endowment of International Peace, the problem is clearly illustrated. His report canvassed the nuclear cities of Sarov, Sneshinsk, Seversk, Zarechniy, and Trekgorniy and contains statistics and facts surrounding the working conditions of Russian nuclear experts. Results include facts such as:

- More than 62% of employees earn less than \$50 per month
- 58% of experts are forced to take second jobs to earn money.
- 89% of experts report a decline in living conditions since 1992.

³² Peter Eisler, “Fuel For Nuclear Weapons Is More Widely Available”, *USA Today*, 26 February 2003, URL: < http://www.usatoday.com/news/world/2003-02-26-nuke-threat-cover_x.htm > accessed 28 December 2004.

³³ Susan Ellis, “Tenet Says Russian Safeguarding of Nuclear Materials Is a Concern”, *USIS Washington File*, 3 February 2000, URL: < <http://www.fas.org/news/russia/2000/000203-rus-usia1.htm> > accessed 06 January 2005.

- 14% of experts would like to work outside of Russia
- 6% express interest in moving to, “any place at all.”
- One respondent stated: “What does it matter, the main thing is that I should be paid money; after all I will be working, not robbing or killing.”³⁴

Similar results were found when technicians working in the Russian missile enterprise were examined.

The ability of terrorist organizations to offer employment to such experts completes the picture of a horrific potential. Billionaire terrorist organizations, such as Al-Qaeda, can easily afford to out bid a technician’s fifty dollar a month salary. Coupling such expertise with accessible materials from civilian reactors and financially bankrupt militaries, the plutonium or uranium nuclear nightmare suddenly becomes possible. This scenario uniting stolen nuclear materials and bribed technological expertise poses an extreme threat to national security.

V. US POLICY ON NUCLEAR WEAPONS

The gravest danger our Nation faces lies at the crossroads of radicalism and technology. Our enemies have openly declared that they are seeking weapons of mass destruction, and evidence indicates that they are doing so with determination.

- President George W. Bush³⁵

The above quotation, embedded in the National Security Strategy of the United States of America, sent a shockwave through the policy making community. The terrorist threat of nuclear detonation had finally risen to the forefront of security issues. No longer could the American people hide securely behind ignorance. As horrible as

³⁴ Valentin Tikhonov, *Russia’s Nuclear and Missile Complex: the Human Factor in Proliferation*, online edition, (Washington DC: Carnegie Endowment for International Peace, 2001)
URL:<<http://www.carnegieendowment.org/publications/index.cfm?fa=view&id=656>>, accessed 08 January 2005.

³⁵ President George W. Bush, *The National Security Strategy of the United States*, 17 September 2002, ii.

September 11 was, it could have been worse. A detonation of a nuclear device in New York City or Washington DC could have claimed the lives of millions and destroyed key financial and government command and control networks. But, has the United States responded with just rhetoric? Are we truly taking the steps required to ensure that the United States is able to prevent a nuclear device from being detonated by a non-state actor within the United States? In order to answer these difficult questions it is first necessary to examine the National Security Strategy and the National Strategy to Combat Weapons of Mass Destruction.

A. The National Security Strategy and Nuclear Terrorism

*“The enemy is terrorism—premeditated, politically motivated violence perpetrated against innocents.”*³⁶

The National Security Strategy bluntly names terrorism as one of the greatest threats to the United States. Within the overview of America’s international strategy is a list of the eight broad focal points required for security. In the top four security concerns to the United States there are two key references to nuclear weapons and terrorism:

- (number 2) *strengthen alliances to defeat global terrorism and work to prevent attacks against us and our friends.*
- (number 4) *prevent our enemies from threatening us, our allies, and our friends, with weapons of mass destruction.*³⁷

This emphasis on terrorism is different from the past.

The National Security Strategy of 2002 clearly changed the security priorities for the United States. Unlike previous versions, it recognizes the new modern threat associated with terrorism. Furthermore, it establishes a completely new mindset required to deal with this threat. Prior to its release, the security strategy was still reminiscent of

³⁶ President George W. Bush, *The National Security Strategy of the United States*, 17 September 2002, 5.

³⁷ President George W. Bush, *The National Security Strategy of the United States*, 17 September 2002, 1.

the Cold War, stressing the need for large armies to be ready for regional conflicts. In his May 1, 2001 address to the National Defense University, President Bush clearly foreshadowed the Security Strategy's upcoming paradigm shift.

*Today, the sun comes up on a vastly different world. The Wall is gone, and so is the Soviet Union... Yet, this is a dangerous world, a less certain one, a less predictable one.*³⁸

The focus of the White House became even more focused after the attacks on the World Trade Center.

The events of September 11, 2001 had a very clear effect on the National Security Strategy. Terrorists who possess the ability to act globally and, potentially, with weapons of mass destruction would require a new U.S. readiness posture. In Chapter III, the National Security Strategy deals with strengthening alliances in order to defeat global terrorism, and lists seven key items necessary for a successful campaign against terrorism. The very first one directs *all* elements of national power to focus on terrorist organizations with global reach which attempt to gain or use weapons of mass destruction.³⁹ By placing the crosshairs of all elements of national power on terrorists seeking WMD, the Bush Administration demonstrates its understanding of the nuclear terrorism threat. However, it is Chapter V that shows the world how far the US will go in its fight against terrorists with nuclear weapons.

Given the unpredictability and possible magnitude of a nuclear terrorist strike, a solely reactive posture may be untenable. Traditional Cold War deterrence died with the issuance of the 2002, National Security Strategy, since the threat of retaliation holds no

³⁸ George W. Bush, "Remarks by the President to the Students and Faculty at National Defense University", Speech as delivered to National Defense University, Washington, DC, 1 May 2001, URL: <<http://www.whitehouse.gov/news/releases/2001/05/20010501-10.html>>, accessed 15 December 2004.

³⁹ President George W. Bush, *The National Security Strategy of the United States*, 17 September 2002, 6.

relevance to an enemy free of state loyalties. Non-state actors hide around the world and eliminate the ability of the US to target an enemy in response to an attack. Furthermore, the enemy openly seeks massive destruction and finds martyrdom in death. Cold War deterrence is incapable of scaring such an enemy. Recognizing this dilemma, the Bush Administration made the unprecedented declaration that it would utilize pre-emptive strikes in order to “forestall or prevent” an act of nuclear terrorism.⁴⁰ With the release of the National Security Strategy in September 2002, the Bush Administration clearly identified the new threat to the American People.

B. The National Strategy to Combat Weapons of Mass Destruction and Nuclear Terrorism

*Weapons of mass destruction...in the possession of hostile states and terrorist represent one of the greatest challenges facing the United States.*⁴¹

In keeping with the President’s new challenge to stop nuclear terrorism, Dr. Condoleeza Rice, then National Security Advisor, and Secretary Tom Ridge, then Director of the Department of Homeland Security, produced the National Strategy to Combat Weapons of Mass Destruction. Released in December of 2002, this document further echoed the President’s call to action against nuclear terrorism. Putting forth a three-pillar principle, the strategy establishes the basic political tenets for approaching weapons of mass destruction. The three pillars-- counter-proliferation, non-proliferation, and consequence management-- create the foundation for the United States’ efforts to meet this apocalyptic threat.

⁴⁰ President George W. Bush, *The National Security Strategy of the United States*, 17 September 2002, 15

⁴¹ *National Strategy to Combat Weapons of Mass Destruction*, December 2002, 1.

i. Counter-proliferation

Counter-proliferation constitutes the first of the three pillars. Immediately recognizing the difficulty of completely eliminating an attack, this pillar illustrates the aggressive nature of the government's fight for security.

*We know we can not always be successful in preventing and containing the proliferation of WMD to hostile states and terrorist. Therefore, the U.S. military and appropriate civilian agencies must possess the full range of operational capabilities to counter the threat and use of WMD by states and terrorist against the United States, our military forces, and friends and allies.”*⁴²

Counter-proliferation breaks down into three sub-categories: interdiction, deterrence, defense and mitigation. Interdiction refers to the ability to actively prevent undesirable state or non-state actors from acquiring WMD. Deterrence sets forth the commander's intent to create an environment dangerous enough to dissuade potential rogue states and non-state actors from going nuclear. Of particular interest, deterrence has acquired a twist to the deterrence posture of the past. While still acknowledging the conventional need to respond to WMD usage with overwhelming force, the Administration added the use of “effective intelligence, surveillance, interdiction, and law enforcement capabilities” to try to stop this type of terrorist type activity.⁴³ This addition to the traditional national policy posture once again illustrates the Administration's understanding of the imminent danger posed by WMD terrorism. Defense and mitigation marks the last subcategory of counter-proliferation. Openly acknowledging the possible failure of deterrence as a stand alone tactic, the administration openly posits the possibility of “pre-emptive measures” if required.⁴⁴ The Strategy further espouses the use of active defenses to disrupt and thwart a WMD attack or prevent a future attack.

⁴² *National Strategy to Combat Weapons of Mass Destruction*, December 2002, 2.

⁴³ *National Strategy to Combat Weapons of Mass Destruction*, December 2002, 3.

⁴⁴ *Ibid.*

“As with deterrence and prevention, an effective response requires rapid attribution and a robust strike capability.”⁴⁵ This posture illustrates the President’s intent to authorize a vigorous pre-emptive strike if required to stop a terrorist with nuclear intent.

ii. Nonproliferation

The nonproliferation pillar renews emphasis on international policy to stop the spread of nuclear weapons. The president’s new emphasis on counter-proliferation does not mean a reduction in the political efforts to stop the flow of WMD technology and materials.⁴⁶ Accordingly, there is to be a renewed effort toward non-proliferation treaties extending benefits to committed non-proliferating countries. The strategy recognizes the United Nations’ International Atomic Energy Agency (IAEA) as a key element in enforcing multi-national agreements. It seeks a Fissile Material Cut-Off treaty and the strengthening of the Nuclear Suppliers Group and Zangger Committee.⁴⁷ These measures would increase the IAEA’s ability to enforce nonproliferation policies followed by the world’s nuclear countries.

The ability to enforce nonproliferation agreements is crucial to securing the loose fissile material that is available today to the determined terrorist. According to the National Strategy to Combat Weapons of Mass Destruction, “Maintaining an extensive and efficient set of non-proliferation and threat reduction assistance programs... is a high

⁴⁵Ibid.

⁴⁶ Robert G. Joseph, “Countering Weapons of Mass Destruction in the New National Security Strategy”, *The Monitor*, vol 9, no. 1, Winter/Spring 2003 (Athens: Center for International Trade and Security).

⁴⁷ **The Fissile Material Cutoff Treaty** would end forever the production of fissile materials for nuclear weapons. Federation of American Scientist, “Fissile Material Cutoff Treaty, URL: <<http://www.fas.org/nuke/control/fmct/>>, accessed 28 December 2004. **The Nuclear Suppliers Group** consists of 30 nuclear suppliers worldwide and seeks to control the exports of nuclear material, equipment, and technology. Federation of American Scientists, “Weapons of Mass Destruction”, URL:<<http://www.fas.org/nuke/control/nsg/>>, accessed 5 January 2005. **The Zangger Committee**, also known as the NPT Exporters Committee, comprises 35 members, including all nuclear weapon states. They produce the “trigger” lists used by the IAEA for identifying equipment and materials subject to export controls. Zangger Committee, URL:<<http://www.zanggercommittee.org/Zangger/default.htm>>, accessed 4 January 2005.

priority”.⁴⁸ By discouraging the accumulation of separated plutonium and working to minimize the world’s usage of highly enriched uranium, the strategy pledges to continue working toward the reduction of fissile material. Utilizing programs aimed at securing nuclear facilities and materials of other countries and sanctions against nonproliferation violators, the U.S. strategy plans to cut off potential nuclear material from falling into the hands of terrorists by making the sources non-existent or too secure. Whether through bilateral agreements, the threat of sanctions, or strengthening of the IAEA inspections, the Bush Administration’s stance on non-proliferation poignantly focuses on stopping the spread of nuclear weapons and thus making the means more difficult to acquire for the terrorists.

iii. WMD Consequence Management

The final pillar to the National Strategy to Combat Weapons of Mass Destruction is consequence management. This task falls generally under the purview of the Department of Homeland Security. As the name implies, it refers to the ability to effectively manage and train local first responders to deal with the consequences and effects of a WMD strike on the homeland. While this pillar’s primary responsibility may seem post-attack and not really falling into the realm of stopping a strike, some believe that if this capability is demonstrated in exercises properly, “It will increase our ability to deter such attacks by persuading our enemies they cannot achieve their objectives.”⁴⁹ While skeptics doubt the ability to deter a terrorist nuclear detonation by demonstrations of responsiveness, the possibility of this seemingly unlikely by-product does not hurt the cause.

⁴⁸ *National Strategy to Combat Weapons of Mass Destruction*, December 2002, 4.

⁴⁹ Robert G. Joseph, “Countering Weapons of Mass Destruction in the New National Security Strategy”, *The Monitor*, vol 9, no. 1 Winter/Spring 2003 (Athens: Center for International Trade and Security), 4.

In reviewing the National Security Strategy and the National Strategy to Combat WMD, the Bush Administration demonstrates full knowledge of the terrorist nuclear threat facing the American people. Critics who attack the Administration for failing to recognize the potential threat of nuclear terrorism may look no further. The United States government clearly addresses the threat in its security strategies. However, recognizing and defeating it are two different issues.

VI. CURRENT US POLICIES

With the Bush Administration exhibiting such a clear understanding of the nuclear terrorist threat, it becomes imperative to examine recently-initiated programs and legislation to determine if the appropriate steps are being taken to ensure the safety of this country.

A. The Proliferation Security Initiative

We must bring to justice those that traffic in deadly weapons, to shut down their labs, to seize their materials, to freeze their assets... we must act on every lead... it must be clear: We will find you, and we will not rest until you are stopped.

---President G. W. Bush⁵⁰

One of the great difficulties that a nuclear-hungry terrorist group would experience is trying to transport nuclear material once it has been acquired. The basic premise behind the Proliferation Security Initiative (PSI) is that it targets the shipping lanes and attempts to close down transportation avenues previously exploitable by terrorists. This global initiative aims to block shipments of biological, chemical, and nuclear weapons to terrorist and countries suspected of proliferation.⁵¹ This bold

⁵⁰ President George W. Bush, "President Announces New Measures to Counter the Threat of WMD" Speech as given at Fort Lesley J. McNair, National Defense University, 11 February 2004, URL:<<http://whitehouse.gov/news/releases/2004/02/20040211-4.html>>, accessed 20 December 2004.

⁵¹ Wade Boese, "The Proliferation Security Initiative at a Glance" *Fact Sheet: Arms Control Association*, June 2004, URL:<<http://www.armscontrol.org/factsheets/PSI.asp>>, accessed 30 December 2004.

counter-proliferation initiative presented by President Bush on May 31, 2003 represents a landmark in international cooperation aimed at preventing nuclear weapons from falling into the hands of terrorists.

To understand the magnitude and limitations of the PSI, it is important to realize that this is a cooperative agreement among countries: “It is an activity, not an organization.”⁵² This activity focuses on enhancing the participating states’ intelligence gathering, military, and law enforcement capabilities through multilateral cooperation and sharing. Not based on any formal treaty, the partnership is purely voluntary, but is seen as an acknowledgment of the need for stronger cooperative measures between countries to prevent proliferation. Actions taken by participating countries are to be consistent with current national law enforcement and international law framework but can be expected to be much more successful due to international information sharing. (See Appendix B, The Proliferation Security Initiative: Statement of Interdiction Principles). This initiative has experienced some tremendous triumphs.

When initially introduced, the United States and 10 other countries made up the partnership. Those countries included Australia, France, Germany, Italy, Japan, the Netherlands, Poland, Portugal, Spain and the United Kingdom. Since its inception, Russia, Canada, Norway, and Singapore have joined the partnership and “some 60 additional states have voiced support of the initiative.”⁵³ More recently, the Czech Republic, Turkey, and Denmark have joined the ranks as core participants. Given the concern of nuclear material security in the former Soviet Union, the Russian desire to

⁵² John R. Bolton, Undersecretary for Arms Control and International Security, “An All Out War on Proliferation,” *Financial Times*, 7 September 2004, URL:<<http://www.state.gov/t/us/rm/36035.htm>>, accessed 30 December 2004.

⁵³ Wade Boese, “The Proliferation Security Initiative at a Glance” *Fact Sheet: Arms Control Association*, June 2004, URL:<<http://www.armscontrol.org/factsheets/PSI.asp>>, accessed 30 December 2004.

participate is of particular note. At the 1 year anniversary meeting held in Krakow, Poland, representatives from over 60 countries assembled. This resounding acceptance worldwide demonstrates the diplomatic success achieved by the Administration within one year of starting the PSI. While growing participation will continue to strengthen this counter-proliferation initiative, the training and operational successes are the true fruits of such co-operation.

The success or failure of the PSI will rest on its ability to intercept illicit weapons being transported. To become capable of meeting that requirement, PSI participants have already begun planning and taking part in training interdiction exercises. These training exercises are intended to involve both civil law enforcement and military assets to enhance participants' capabilities to perform sea, air, and ground interdiction operations. On September 5, 2003, Exercise Pacific Protector was announced as the first of ten such planned exercises. These exercises included everything from Italian-led air and sea interdiction in the Mediterranean to Polish-led ground interdiction.⁵⁴ Continuing this training will be essential to building the trust and confidence amongst the international PSI members. Done publicly, it will also serve to deter terrorists from attempting transportation. However, the ability to stop weapons material transfers will always be the greatest lifeblood to the initiative.

The most successful and telling example of the PSI initiative was the seizure of a shipment destined for Libya in October of 2003. Released to the public on February 11, 2004, in a speech given by President Bush, the seizure of the *BBC China* resulted in the confiscation of centrifuge parts capable of producing nuclear weapons material destined

⁵⁴ Proliferation Security Initiative, URL: <<http://www.globalsecurity.org/military/ops/psi.htm>>, accessed 17 December 2004.

for Libya. Exemplifying the true workings of the PSI, U.S. and British intelligence identified the shipment originating in Malaysia and tracked its progress to Dubai. There it was loaded on the German-owned shipping vessel, the *BBC China*. After alerting the German and Italian authorities, the ship was stopped and searched and its cargo seized after passing through the Suez Canal. Oddly, shortly after the incident, Libya announced its intentions to terminate all nuclear, chemical, and biological weapons programs. “While it can not be proven, it is reasonable to assume that the interdiction contributed to Libya’s decision...,” according to one observer.⁵⁵ Furthermore, with the bilateral agreements between the U.S. and Panama and U.S. and Liberia, nearly 15% of the world’s roughly 50,000 ton cargo ships are now subject to boarding and inspection on short notice. If all of the nations represented at the Krakow meeting were to make similar agreements the number would rise to 46 percent of the worlds shipping.⁵⁶ The PSI is growing in acceptance and already showing substantial results after just one year. However, this fast track initiative has limitations.

The greatest limitation of the PSI lies in enforcement, as currently everything the PSI stands for rests on volunteer cooperation by participating countries. In order to create the desired net, capable of stopping WMD transport, global cooperation would be required. While growing in membership, there are still many countries not volunteering to be a part of PSI. If such membership was achieved, there would still be an incredible amount of trust required amongst participating countries. As long as participants choose

⁵⁵ Baker Spring, “International Smuggling Networks: Weapons of Mass Destruction Counterproliferation Initiatives”, Testimony to Senate Committee on Governmental Affairs, 23 June 2004, URL:<<http://www.hertiage.org/research/missiledefense/tst081104b.cfm>>, accessed 29 December 2004.

⁵⁶ Ralph A Cossa, “Multilateralism and Democracy March On, To Many Different Drummers” *Comparative Connections: An E-journal on East Asian Bilateral Relations*, 2nd Quarter 2004, URL: <<http://www.csis.org.pacfor/cc/0402Qoverveiw.html>>, accessed 30 December 2004.

the international well-being over Realpolitik one hundred percent of the time, there might be a chance. Some of these countries, Russia and US for example, have to overcome sixty-plus years of deception and distrust. Without the authority to inspect activities and punish violations the communal sharing rests on a shaky foundation. Amongst strong allies, the PSI appears to be effective. But, as more countries with diverse cultures and beliefs join the PSI, the ability to control results will slip. It seems awfully hard to expect victory over our greatest danger to rest in the power of a group hug.

The complex legal ramifications of the PSI also present numerous challenges in the future. While under international law, states hold significant power to stop and seize cargo in their territorial waters or airspace, this authority evaporates while on the high seas or in international airspace. Under international law, a ship suspected of transporting WMD under the flag of a foreign state unwilling to grant PSI participants permission to board would be safe to transit to another non-PSI country without interference.⁵⁷ To board and search this vessel, except under very explicit situations, would be a violation of international law and outside the authority of PSI participants. Similar legal roadblocks surround aviation and land transport too. Here non-PSI countries are safe havens because of their state sovereignty, a customary law as well as UN Charter backed. These legal blocks to interdiction efforts would allow the wise transnational nuclear terrorist to ship material to a non-PSI country like Mexico, for example, and then transport the contraband material overland right to our border.

The last problem with relying on PSI to stop the transnational nuclear terrorist is the unknown size of their device. A small briefcase-size device would easily produce

⁵⁷Andrew Prosser, and Herbert Scoville Jr., *The Proliferation Security Initiative in Perspective*, 16 June 2004, URL:<<http://www.cdi.org/pdfs/psi.pdf>> accessed 7 January 2005, 3.

enough of a catastrophe to satisfy a terrorist. The ability for PSI participants to identify such cargo, follow it and successfully capture it is questionable. It becomes even more difficult if the small individual parts are transported separately with the intent to assemble them upon reaching its destination. Such small devices could easily slip by boarding parties even if the ship was seized and searched. Clearly, such an initiative works better trying to prevent state actors from importing the materials necessary for production of weapons grade nuclear material. Even with its current shortcomings, it is important to remember that the PSI is still in its infancy.

Regardless of its immediate success, the PSI creates the opportunity to bring the issue of transnational WMD transport to the forefront of participating countries' politics. As long as the limitations of the program are recognized and the cooperative intelligence sharing emphasized, PSI will prove to be a step in the right direction. Clarifying its authority and clearly indicating its intent with regards to international law would serve to calm distrustful countries and strengthen its acceptance. It is not the all-encompassing stopgap but does provide a starting point toward heightening awareness and building international trust.

B. United Nations Security Resolution 1540

The PSI was not the full extent of the Bush Administration's international effort for tighter control of nuclear material. On April 22, 2004 the United Nations Security Council (UNSC) unanimously adopted an anti-proliferation resolution "by which it decided that all States shall refrain from supporting by any means non-State actors that attempt to acquire, use, or transfer nuclear, chemical, or biological weapons and their

delivery systems.”⁵⁸ As the original sponsor of this resolution, the Bush Administration again leaned forward in its fight to secure our homeland.

Motivated by September 11, 2001 and feeling that time was of the essence, President Bush called upon the UNSC to produce an anti-proliferation resolution. In his call to the UNSC he had three primary objectives: 1) to criminalize the proliferation of weapons of mass destruction and related materials, 2) to enact and enforce strict export controls, and 3) to secure sensitive material within their borders.⁵⁹ Quite different from the PSI, the US sought this resolution as a means of requiring UN countries to enforce strong national controls prohibiting proliferation. This is the first ever United Nations Security Council Resolution directly addressing the prevention of proliferation of WMD and marked the first time in almost twelve years that the Security Council had even addressed the issue.⁶⁰ The Bush Administration clearly served as the catalyst for revisiting this threat and pressing for the UN to acknowledge and deal with transnational terrorists seeking WMD.

The most important aspect of UNSCR 1540 revolves around the enforcement of its provisions. Unlike PSI, which requires cooperation and utilizes existing international law, UNSCR 1540, enacted under Chapter VII of the UN Charter and through the

⁵⁸United Nations Security Council, “Security Council Decides All States Shall Act to Prevent Proliferation of Mass Destruction Weapons” press release SC/8076 28 April 2004, URL:<<http://www.un.org/News/press/docs/2004/sc8076.doc.htm>>, accessed 5 January 2005.

⁵⁹ Andrew K Semmel, Principle Deputy Assistant Secretary of State for Nonproliferation, “US Perspective on UN Security Council Resolution 1540”, Speech presented to Asia Pacific Nuclear Safeguards and Security Conference, 8 November 2004, URL: <<http://www.state.gov/t/np/rls/rm/38256.html>>, accessed 3 January 2005.

⁶⁰ Foreign and Commonwealth Office, “United Nation Security Council Resolution 1540” *UK Priorities: Terrorism and Security*, URL:<<http://www.fco.gov.uk/servelet/font?pagename=openmarket/xcelerate/showpage&c=page&cid=1096637816227>>, accessed 8 January 2005.

Security Council, is legally binding. States will be required to follow its provisions. In condensed form, the resolution calls on states to:

- 1). Draft national legislation criminalizing the possession, manufacturing, or trafficking of WMD with special emphasis on terrorist activities.
- 2). Utilize appropriate and cooperative action to prevent illicit WMD trafficking.
- 3). Develop and enforce appropriate export controls wherever necessary.
- 4). Develop and provide appropriate physical protection for WMD facilities and storage sites.

Most importantly, every country's progress toward security will be strictly monitored.

The passing of this resolution requires all UN states to submit a report within six months of adoption explaining to the Security Council the steps taken, or to be taken. (See Appendix C, paragraph 9) Aside from the report it also requires all states to “renew and fulfill their commitment to multilateral cooperation, in particular within the framework of the International Atomic Energy Agency.”⁶¹ This statement is a direct reflection of President Bush's statement in the National Security Strategy illustrating his desire to empower the IAEA to do its job. Under the UNSCR 1540, it is hoped that future state actors who interfere with IAEA inspections, the way pre-war Iraq did and present day Iran does, will be dealt with resolutely by the UN.

The final important point to note regarding UNSCR 1540 is the pledge of cooperation between participating nations. This spirit of cooperation, expressed in UNSCR 1540 (Appendix C, paragraph 7), plays a key role in presenting the multinational nuclear terrorist threat as a world problem and not just one of individual countries. Moreover, the terrorists often operate more easily in countries with weak infrastructure or

⁶¹ United Nations, *United Nations Security Resolution 1540*, 28 April 2004, URL:<<http://www.state.gov/t/np/rls/other/31990.htm>>, accessed 15 December 2004, para. 8(c).

new governments lacking sufficient law enforcement assets. This pledge of cooperation enables such countries to request, or maybe even be persuaded, to accept help in matters of nuclear materials security. This pledge for cooperation serves to further the Administration's attempt to educate the world as to the WMD dangers that are present. It creates a pathway to offer assistance to those who need it, and opens in an acceptable way doors to enter other countries with the intent to shut down nuclear materials trafficking. By superimposing UNSCR 1540 over the PSI, the net seems to be getting tighter on nuclear terrorists. However, as is the case with the PSI, problems exist that need to be recognized.

The biggest problem with UNSCR1540 is the unwillingness of the UN to act on its resolutions when a country is found in violation. As alluded to earlier, one need not look further back than the period between the two Gulf Wars. During that time, sixteen United Nations Security Resolutions were violated, yet nothing more than sanctions was ever backed by the UN. The IAEA continues to have problems inspecting countries determined to avoid nuclear program oversight, since the UN does not have the capability to enforce its decrees. Today, the United Nations consists of 191 nations, all of which have their own national interests and foreign policies. To highlight the impotence of the UN in the post-Iraq, post-Oil-for-Food scandal era, the UN still has been unable to deal with human rights violations in the Sudan and is consistently criticized for being weak.⁶² This begs the question as to what has changed then with UNSCR 1540? Truthfully one could say...nothing. Today, the UN suffers from a perception of being unable to take meaningful action upon violators. In order for UNSCR 1540 to be of any real power, all

⁶² Eva Dardrian, "Sudan: UN Resolutions Continue to be Weak and Meaningless", *Pambazuka News* December 2, 2004 URL:<<http://www.globalpolicy.org/security/issues/sudan/2004/1202meaningless.htm>>, accessed 8 January 2005.

of these countries must recognize the importance of stopping transnational nuclear terrorism *and* be willing to make the sacrifices necessary to stop it, even if the threat does not appear to be aimed at one's own country.

The other dilemma facing UNSCR 1540 is the timeliness of its responsiveness, since terrorist attempting to acquire and transport nuclear materials may be consistently moving. By the time information is relayed and a decision is made to commit UN forces into a terrorist-hosting nation, the likelihood of the terrorist cell still being in that location is doubtful. On top of that, one could add the time required to assemble the necessary forces. The need for a deployable UN standing police force to enable the UN to forcefully back its decisions is not new.⁶³ The perceived impartiality of such a force would allow the UN to work within international law and to avoid sovereignty issues inherent in international enforcement. Without such a capability, however, the UN will never be able to mobilize quickly and arrest violators of UNSCR 1540.

C. Nunn-Lugar Legislation and the G8 Global Partnership

This global partnership represents a major step in the right direction in terms of how the United States and its partners and allies must work together to prevent

dangerous groups from gaining control of the most dangerous materials—materials that could be used to carry out catastrophic terrorism.

-Senator Sam Nunn⁶⁴

With the collapse of the Soviet Union there suddenly came into being a vulnerable supply of nuclear materials, technology, and unemployed expertise.

Recognized in the early 1990's as a serious concern for global security, the United States

⁶³ Don Kraus, "The Need for UN police", *Foreign Policy in Focus: A Think Tank Without Walls*. 5 June 2003, URL: <<http://www.globalpolicy.org/security/peacekeeping/reform/2003/0605police.htm>>, accessed 8 January 2005.

⁶⁴ *Protecting Against the Spread of Nuclear, Biological, and Chemical Weapons: An Action Agenda for the Global Partnership*, Vol. 1, (Washington: The CSIS Press, 2003), xi.

decided it had to act. Overnight, the collapse of the FSU resulted in “tens of thousands of Russian nuclear warheads and hundred of tons of nuclear-usable materials” scattered around the country in poorly secured facilities.⁶⁵ The desperate economic conditions left scientists, engineers, and military personnel employed in WMD activities, vulnerable to criminal employment. The possibility of WMD proliferation amongst emerging nations was severe. In 1991, Senators Sam Nunn and Richard Lugar introduced the Nunn-Lugar legislation in the US Senate. Its passing marked the beginning of the U.S. Cooperative Threat Reduction Program which initially dealt with the dismantling and disposal of the Former Soviet Union’s (FSU) arsenal. From its humble beginnings, this program has evolved into a \$1 billion multi-agency effort to secure WMD and associated materials from the dismantled FSU. Most importantly, it has served as the impetus for this Administration to take the problem before the Group of Eight (G8) countries to accelerate this security risk cleanup in the wake of September 11.

In the last decade, the success of the Cooperative Threat Reduction Program has been notable. Since its inception, the program has resulted in the complete disarmament of the Ukraine, Kazakhstan, and Belarus and the dismantlement of over six thousand nuclear weapons. However, more than twenty thousand nuclear weapons remain at one hundred and twenty-three storage sites and a “massive 1,350 metric tons of highly enriched uranium and weapons grade plutonium remain dispersed ...in a variety of secure and insecure circumstances throughout the worlds largest network of nuclear facilities

⁶⁵*Protecting Against the Spread of Nuclear, Biological, and Chemical Weapons: an Action Agenda for the Global Partnership*, Vol. 1, (Washington: The CSIS Press, 2003), xi.

employing nearly one million people.”⁶⁶ After thirteen years of progress, the amount of work remaining to ease the United States’ security concerns is daunting.

With the attacks of September 11, the immediacy of the threat changed. No longer is the concern that the FSU’s nuclear materials might fall into the hands of an emerging state, but rather that the transnational terrorists now pose the greatest threat. The speed and willingness of a nuclear non-state actor to employ stolen materials, or expertise, greatly increases the urgency toward securing the FSU arsenal. No longer was the bilateral agreement between Russian and the United States alone enough and therefore, President Bush turned toward the G8 summit of June 2002 for assistance with the FSU arsenal.

The leaders of the G8 countries accepted the challenge and adopted the G8 Global Partnership against the Spread of Weapons and Materials of Mass Destruction. Unlike the previous two Bush Administration initiatives, working to stop the transport of nuclear materials, this partnership goes to the heart of the matter-- supply. Committed to preventing terrorists or those who harbor them from acquiring or developing WMD, the partnership addresses nonproliferation, disarmament, and nuclear safety/environmental issues with particular emphasis on the FSU. Amongst the G8 participants, the “initial focus of the Global Partnership was identified as cooperative projects with Russia.”⁶⁷ To finance the program, these countries agreed to raise \$20 billion over the next ten years. President Bush pledged to supply half of this with the remaining \$10 billion to be raised by the other countries.

⁶⁶ *Protecting Against the Spread of Nuclear, Biological, and Chemical Weapons: An Action Agenda for the Global Partnership*, Vol. 1, (Washington: The CSIS Press, 2003), vii.

⁶⁷ Bureau of Nonproliferation, “The G-8 Global Partnership Against the Spread of Weapons and Materials of Mass Destruction,” Fact Sheet, URL:<<http://www.state.gov/t/np/rls/fs/34967.htm>>, accessed 5 January 2005.

The Global Partnership's focus of the first two years has been Russia. With regards to the nuclear dilemma, cooperation projects have been instituted to dismantle decommissioned nuclear submarines, secure and dispose fissile materials, and redirect the employment of former weapon scientists to peaceful civilian endeavors.⁶⁸ This final step is of important note. While the initial Nunn-Lugar programs focused on securing existing nuclear weapons and materials, the potential threat of scientists leaving Russia and seeking employment with dangerous state or non-state actors has been a more recent concern based on a better understanding of the economic woes facing the FSU. Through the use of existing agencies such as the International Science and Technology Centers (ISTC), the Science and Technology Center in Kiev, Ukraine (STCU), Initiatives for Proliferation Prevention (IPP), and the Nuclear Cities Initiative, the G8 Partnership will seek to provide alternate civilian employment for weapons scientists. The Washington-based Center for Strategic and International Studies recommends that expanding such programs would aid in "providing self sustaining commercial and other civilian employment opportunities for former weapons scientists" and be critical in fostering a sustainable threat reduction.⁶⁹

One of the earliest success stories of the Bush Administration's Cooperative Threat Reduction Program has been developing a growing worldwide involvement. At the G8 Summit in June 2002, the G8 countries invited all countries, cognizant of the threat posed by transnational WMD terrorist, to take part. In 2003, six new donor countries pledged financial support-- Finland, Netherlands, Norway, Poland, Switzerland,

⁶⁸ Bureau of Nonproliferation, "The G-8 Global Partnership Against the Spread of Weapons and Materials of Mass Destruction," Fact Sheet, URL:<<http://www.state.gov/t/np/rls/fs/34967.htm>>, accessed 5 January 2005.

⁶⁹ *Protecting Against the Spread of Nuclear, Biological, and Chemical Weapons: An Action Agenda for the Global Partnership*, Vol. 1, (Washington: The CSIS Press, 2003), 6.

and Sweden. Together these countries have committed about \$210 million toward the security project. At the Sea Island Summit of 2004, the G8 countries further welcomed the contributions of Australia, Belgium, the Czech Republic, Denmark, Ireland, the Republic of Korea, and New Zealand. The Sea Island Summit further illustrated the future possibilities for international security by looking to expand the Global Partnership's assistance worldwide. For example, the retraining and employment of Iraqi and Libyan scientists involved with WMD programs is on the horizon for the partnership.⁷⁰ The daunting task of securing worldwide nuclear materials, facilities, scientists and technicians will occupy the G8 countries indefinitely. As the momentum of these partnerships increases and more countries join, terrorists will find it more and more difficult to acquire the necessary materials.

The greatest drawback to the Bush Administration's global partnership is the time it takes to accomplish the tasks. The threat has been accurately assessed and the objective of the G8 countries is an age-old wartime tactic: cut the supply lines. However, given the potential availability of nuclear materials and expertise today, it is difficult to call a program, which stretches out over the next ten years, as aggressive enough to combat the threat. Furthermore, to be successful, Realpolitik and the international good will have to merge on the subject of nuclear terrorism. The Washington, D.C. based Center for Strategic and International Studies accurately describes this dilemma in one of their reports:

⁷⁰ John R. Bolton, Under Secretary for Arms Control and International Security, "Sea Island and Beyond: Status Report on the Global Partnership Against Weapons of Mass Destruction", Testimony before the Senate Foreign Relations Committee, 15 June 2004, URL:<<http://www.state.gov/t/us/rm/33615.htm>>, accessed 6 December 2004.

*Achieving adequate support for Global Partnership Programs in the world's leading industrialized democracies will require elected officials to make hard choices among competing priorities, which in turn will require the backing of well informed citizens. Therefore, if G8 and other countries are to forge a truly effective partnership against the global WMD threats, governments must be joined by parliaments and publics.*⁷¹

VII. WHERE DO WE GO FROM HERE ?

The transnational nuclear terrorist threat will continue to plague this Administration and the administrations to follow for many years. Internationally and domestically this Administration recognizes the threat and is desperately attempting to secure the homeland from nuclear terrorism. Cooperative agreements, strict UN resolutions, and the security of nuclear material and technical knowledge help-- but more must still be done. So far, attempts are being made to monitor loosely-secured nuclear supply sources, and intercept materials being transported along the sea, air, land, lines of communication, while simultaneously, the UN encourages states to empower their own security teams to enforce anti-proliferation regulations. While these measures cover the supply lines and the transportation medians, the United States' military forces continue to fight the War on Terror by actively and systematically targeting terrorist organizations and harboring governments. Domestically, the Administration continues to build a security net illustrated by the creation of the Department of Homeland Security and the USNORTHCOM which is responsible for the military focus on homeland defense. A brief assessment would indicate that the Administration has established a web capable of

⁷¹ *Protecting Against the Spread of Nuclear, Biological, and Chemical Weapons: An Action Agenda for the Global Partnership*, Vol. 1, (Washington: The CSIS Press, 2003), 2.

stopping the transnational nuclear terrorist. However, this is not even remotely the case. There is much more work to be done. There must be a tremendous push for all countries to be made aware of the worldwide effects of a nuclear terrorist strike. The United Nations needs to take this threat seriously and re-evaluate the IAEA's role in nuclear policing, and finally an international sharing of intelligence must be established to focus on stopping the terrorist before they strike. The following recommendations seek to contribute toward enhancing the international response to the threat.

A. Political Push for Education

Although the current political initiatives at work today are crucial in stopping nuclear terrorism, there is a significant gap. At the PSI one-year reunion, sixty countries expressed interest in the efforts underway, but that amounts to only 31 percent of the UN countries. If one looks at those actively taking part, the number drops to 8 percent of the UN currently taking part in the challenge to stop the transportation of nuclear material. The same test applied to the G8's Global Partnership against the Spread of Weapons and Materials of Mass Destruction results in only 11 percent of the UN countries actively participating.⁷² Clearly, when the success of the anti-proliferation web relies on international cooperation, this enormous gap in participation must be addressed. Now that these initiatives are running, if the Administration fails to undertake a tremendous membership drive then these programs will amount to nothing more than an exercise in futility.

Without an education effort to promote globalization of anti-proliferation these plans will fail. The Administration should seek to highlight the worldwide effects of a

⁷² This number takes into account all countries who have already pledged money including the seven countries signing up to take part at the Sea Island Summit 2004. The seven countries that have joined recently have not yet determined the extent of their contribution.

nuclear detonation in order to break the Realpolitik mindset of countries and emphasize the need for participation in stopping nuclear minded terrorists. Countries must be made to understand the potential worldwide affects of a terrorist detonation. For example, educating a non-targeted country to the global economic fallout resulting from a terrorist attack may encourage a previously nonparticipating country to become active. Since terrorists see the US economy as a vulnerable and lucrative target, the effects of a US economical collapse on the world economy could result in a global depression. Furthermore, it is not just a US market collapse that could shake the world economy. Any enemy of the terrorist cause could become a target. Due to the interdependence of the global economy, the failure of any country's economy would have far reaching affects. In some cases, the resultant economic instability could send other countries spiraling toward anarchy. Such instability would threaten any existing government regardless of whether or not it is a democracy or dictatorship. It cuts across all political lines and threatens the foundation of any standing government. By illustrating the perils of a nuclear terrorist attack that threaten *all* governments, regardless of direct involvement, the Administration may hope to increase participation of all United Nation countries. Deliberately seeking common ground, such as economics and political stability, is essential to increasing global participation and stopping the nuclear terrorist threat.

B. Strengthening the IAEA

The IAEA must be strengthened and legitimized. In the recovery of the UN Oil-for-Food scandal, an incredible opportunity exists for the UN to clean house and make a fresh start. President Bush has stated over and over his desire to empower the IAEA and

submitted what he refers to as the *Additional Protocol*. This requires states to declare a broad range of nuclear activities and allow the IAEA to inspect.⁷³ He is also proposing that states under investigation be banned from serving on the IAEA. While certainly a start, these initiatives fail to give the IAEA the teeth it needs to stop illicit nuclear activities. In order to accomplish the immense task of protecting the world, the IAEA should be expanded, equipped with international intelligence cooperation, if not its own intelligence operators, and have access to a UN quick-reaction force that could move with the authority of the UN to respond nuclear violations. Interpol may be able to provide such a capability but it would have to be independent of other requirements and specifically tasked to the UN and the IAEA. This would not be a large standing UN Police Force but a small lightly-equipped specialized force capable of providing relatively unobtrusive security at some site while providing the UN Security Council the time needed to act. This QRF could further support UNSCR 1540 by using its own intelligence to legally intercept nuclear materials being transported in cooperation with sovereign nations. Success will depend on a speedy response and an understanding among nations as to the severity of this threat. In turn, the UN would gain additional legitimacy. Enforcement capabilities could also be used to assist weaker nations with enforcing the regulations necessary to stop nuclear transport. To successfully interdict terrorists trying to transport illicit nuclear materials, borders will have to be crossed, and the UN is the only body capable of enforcing rulings across borders while maintaining the appearance of sovereignty. If in the wake of the Oil-for-Food fallout the UN fails to assume the role of enforcing its resolutions, then the US will have no choice but to

⁷³ President George W. Bush, "President Announces New Measures to Counter Weapons of Mass Destruction", speech as given to the National Defense University, 11 February 2004, URL:<<http://whitehouse.gov/news/release/2004/02/20040211-4.html>>, accessed 10 January 2005.

exercise its right to pre-emption. This might temporarily foil terrorists, but on the global scale would infuriate many and quite possibly make the problem worse. To succeed in securing this nation the Administration must ensure the UN succeeds and can leverage the tools necessary to back its mandates.

C. International Intelligence

The need for an international intelligence agency also needs to be addressed. Clearly, countries never wish to share intelligence capabilities and sources. However, the gravity of this threat demands that old paradigms be broken. Countries must learn to share information regarding nuclear activities and terrorists in the market for nuclear capabilities. One could link agency to the UN and its QRF, giving the international community, for the first time, the ability to regulate, inspect, and enforce the requirements of security resolutions. The ability to share information would strengthen the success of PSI activities and help focus the continuing efforts of the Global Partnership by highlighting potential targets in need of security assistance. All of this comes back to one thing: the ability of the US and its allies to educate the rest of the world in order to achieve maximum participation to form an impermeable web to stop nuclear terrorists.

V. CONCLUSION

The Bush Administration clearly understands the threat to national security posed by nuclear terrorism, and its international efforts continue to gain momentum. However, stopping the illicit transportation of nuclear materials, the hiring of scientists and technicians, and securing vulnerable uranium and plutonium sites will take years at best. There is simply no quick solution that will prevent terrorists from acquiring and

detonating a nuclear device. To insinuate otherwise is to base our defense upon hope. The Department of Homeland Security continues to work feverishly alongside the Department of Defense to monitor and secure our coastlines and interior, while the US Armed Forces continue to prosecute the Global War on Terror, hoping that their efforts will keep the terrorist organizations disorganized and fighting on foreign soil. However, unlike the aforementioned tactics the UNSCR1540, the PSI, and the Global Partnership are political measures aimed at bringing the entire world together in opposition to terror. These political initiatives alone harbor the potential to unite the world against terrorism. The strength of terrorism lies in its flexibility and ease of global movement. By increasing participation in the political arena these strengths will become exponentially harder for the terrorist to exploit. With a specialized intelligence organization linked to a UN backed anti-nuclear quick reaction force, terrorists bent on nuclear destruction will find themselves attacking a unified global defense.

APPENDIX A: SUMMARY OF EFFECTS FROM TERRORIST NUCLEAR DETONATION

Excerpt taken from

27th SESSION OF THE INTERNATIONAL SEMINARS ON PLANETARY EMERGENCIES

NUCLEAR AND BIOLOGICAL MEGATERRORISM

URL:<<http://www.fas.org/rlg/020821-terrorism.htm>>

August 21, 2002

**Richard L. Garwin
Senior Fellow for Science and Technology
Council on Foreign Relations, New York**

TERRORIST NUCLEAR EXPLOSIVES. A terrorist nuclear explosive would devastate a city, whether detonated in the hold of a ship in harbor, in a cargo container, in a cellar, or in an apartment. The essential ingredient for a nuclear explosive is fissile material-- highly enriched uranium (HEU) or plutonium. Although the yield of the uranium bomb that devastated Hiroshima was 13 kilotons (13,000 tons of TNT equivalent), and the plutonium bomb which destroyed Nagasaki yielded 20 kilotons, nominal U.S. and Russian strategic weapons now are in the range of 150 kt. A recent report details the damage of what we expected from explosions of 1, 10, and 100 kt at ground level in a city. The Table taken from NCRP shows the approximate radii to which the quality or destruction extends, for the 1 kt and 10 kt yields⁶.

Consider a 1-kt explosion. This might occur from a gun-type device with less material than was used at Hiroshima, or a plutonium implosion-type device made from reactor-grade plutonium and yielding only a "fizzle" because of a large neutron background from the reactor-grade plutonium. On the other hand, the plutonium device might yield 10 kt, so both are shown in the Table.

Table-- Summary of ranges for significant effects (in meters).				
Yield (kt)	(a)*	(b)*	(c)*	(d)*
1	275	610	790	5500
10	590	1800	1200	9600

a* Range for 50% mortality from air blast (m)

b* Range for 50% mortality from thermal burns (m)

c* Range for 4 Gy initial nuclear radiation (m)

d* Range for 4 Gy fallout in first hour after blast (m)

Considering the numbers for 1 kt, we see that people out to 275 m (900 feet) are likely to die from the blast. We can transform the first three columns into the number of Manhattan city blocks which would be destroyed, simply by equating the area within the circle of 50% effect to a number of city blocks⁷.

The conversion was made by noting that Central Park is 836 acres, and there are 247 acres in a sq km. Thus Central Park is 3.38 sq km. Extending from 59th St. to 110th St., it is 51 blocks north-south and three large blocks east-west. Thus it has 153 large Manhattan blocks. There are thus 45 Manhattan blocks per sq km.

The city blocks destroyed by air blast (50% mortality in the "cookie cutter" approximation-- 100% lethality out to the 50% line, and 0% mortality beyond that): 11

City blocks in which almost everyone would die from thermal burns: 53

City blocks in which people would get a lethal dose of prompt nuclear radiation: 88

For the 10 kt explosive, the results are 49, 457, and 203 city blocks.

To convert these areal measures into fatalities, we might take a particularly high local daytime Manhattan population density of 125,000 per sq km or an average of about 2360 people per Manhattan block. So for the 1-kt explosion, some 210,000 people would die-- mostly from prompt radiation within a week or so. Of these, 30,000 would have died from blast earlier, and about 100,000 from burns.

For the 10-kt explosion, about a million people will die from burns. Less than half of these would have died from radiation exposure.

As for fallout, the Table is to some extent misleading, since this provides the distance at which lethal fallout within one hour might be deposited, but it is not a circle of that radius. From the 1977 "Effects of Nuclear Weapons," Table 9.93 (p. 4.30) we see that for a reference dose rate (i.e., for a 1 kiloton explosion) of 3 Sv per hour (300 rads/hr), the downwind distance would be 4.5 miles, and the width about 0.15 miles, for a region affected on the order of 0.7 square miles or 1.5 square kilometers, or 80 Manhattan blocks. So the fallout, although lethal, would not totally dominate the casualties from a nuclear explosion.

Compared with an air burst of a large nuclear weapon at an altitude designed to maximize the blast damage, the prompt radiation and the fallout are far worse with a terrorist explosion. This comes about because the bomb detonated at or near surface of the Earth throws up an enormous amount of earth and vaporized structure, which descends in the immediate neighborhood, providing lethal fallout, which is essentially absent when the fireball does not touch the ground.

If it were known that a nuclear explosion was to take place, evacuation would be highly desirable. And as in the case of potential reactor accidents (with or without terrorist

involvement) it would be very useful to have distributed and ready for use potassium iodide (KI) tablets or capsules. A 130-mg dose would block the uptake of radioactive iodine to a young thyroid (or to a nursing mother), and avoid many thyroid cancers which would destroy the thyroid and might be lethal.

Of course, hospitals would be overwhelmed with the number of people actually injured by flying glass, suffering from radiation exposure, and the like. Furthermore, transit in the city would be disorganized in the regions effected. With buildings down over a square kilometer or so, as was evident in the case of the World Trade Center collapse covering 1% of that area, severe damage to the communications and transportation infrastructure would be expected.

Organized medicine would be unable to cope. A volunteer emergency medical corps, with adequate planning and practice, could save some people who would otherwise die.

Nevertheless, a terrorist nuclear explosion would explode in one place, or a very few, compared with the nuclear attack which we feared for many years and decades from the Soviet Union. So other localities could send personnel and supplies and be a destination for evacuation from contaminated areas.

Public safety personnel would need to use radiation detectors to determine places which posed no continuing radiological problem; regions in which people could not stay for even an hour or five hours without a high likelihood of dying within weeks from radiation damage; and regions in which radioactivity was clearly evident, but which would add perhaps only 1% to the 20% of American citizens who ultimately die of cancer instead of from some other disease.

The effects of a nuclear detonation in a city are so horrendous that it is clear that most effort should be placed on preventing access by terrorists to nuclear materials or weapons; to interdicting the transportation of weapons or the building of improvised nuclear devices; and to keeping them out of areas of large population density⁸.

Unlike the case of large-scale nuclear war, a single terrorist nuclear explosion would not eliminate the resources of the rest of the country, so healthy survivors could be accommodated elsewhere. Those in the regions subject to substantial fallout could receive expedient medical care, but little can be done for those exposed above the levels shown in the Table. Unlike BW attack, a nuclear explosion is evidently far better prevented than treated.

Stolen or diverted military nuclear weapons are rugged, but they are usually provided with substantial protection against unauthorized detonation, so considerable skill might be required to employ one. On the other hand, an improvised nuclear device (IND) would not have this problem, but can be difficult to carry off. The fissile material is not an article of commerce and itself would have to be stolen or diverted. The first plutonium bomb incorporated 6 kg of weapon-grade plutonium, of which more than 250 tons has

now been made worldwide-- enough for 40,000 such crude weapons. Almost all was produced by the United States and the Soviet Union.

In addition, every large nuclear power reactor produces annually on the order of 200 kg of plutonium, which is not and need not be weapon grade to make an improvised nuclear device. In January 1997 the U.S. Department of Energy stated of reactor-grade plutonium, "Proliferating states using designs of intermediate sophistication could produce weapons with assured yields substantially higher than the kiloton-range possible with a simple, first-generation nuclear device."

At the March 6, 2002 hearing of the Senate Foreign Relations Committee, Senator Joseph Biden quoted former Los Alamos National Laboratory Director Harold M. Agnew to the effect that "If somebody tells you that making a plutonium implosion weapon is easy, he is wrong. And if somebody tells you that making an improved nuclear device with highly enriched uranium is difficult, he is even more wrong." Plutonium metal can be safely accumulated in spherical form up to the so-called "critical mass" of 10 kg for weapon-grade plutonium or 13 kg for reactor-grade plutonium. The analogous critical mass for 94% U-235 is 52 kg, and these numbers set the scale for the amount of fissile material required for a nuclear weapon.

Instead of being assembled by high explosive as in the plutonium bomb (which can also be used for assembly of a uranium core) the Hiroshima bomb was two solid masses of highly enriched uranium metal, one of which was propelled in a shortened, converted naval gun to form more than a critical mass with the stationary uranium metal. Although less efficient, this is far simpler than is the plutonium IND.

With the enriched-uranium gun-type weapon, there is an additional means of preventing significant nuclear energy release. Guns are exquisitely sensitive to the presence of neutrons--a relatively few neutrons will guarantee that only a very small amount of fission energy is released. This is evident from the prompt criticality accidents at Los Alamos, which killed people in the room by acute radiation sickness over a period of weeks, but did not even disrupt the fissile assembly. It is possible with a neutron source of one kind or another to flood the uranium remotely with neutrons at such a rate that, even if the smokeless powder is fired to assemble the uranium, no significant yield will result.

The best single protection against the terrorist use of such weapons is to deny the acquisition of the necessary plutonium or enriched uranium. The low-enriched uranium used in U.S. nuclear reactors (typically 4.4% U-235) can in no way be used directly to make a nuclear explosive. That is true up to about 20%, for which the critical mass is 800 kg. HEU is used not only in nuclear weaponry, but in some research reactors and in fuel for naval reactors, such as propel our aircraft carriers and many of our submarines. Likewise, Russian nuclear-propelled ships use HEU. And in Russia particularly, stocks of HEU and plutonium (even weapon plutonium) do not have nearly the security provided to their nuclear weaponry.

After some months of denigrating U.S. programs which have existed since 1994 to help Russia protect weapon-usable materials, the Bush Administration in December 2001 recognized the seriousness of this problem and that something can be done to solve it, and has increased the budget for such Cooperative Threat Reduction activities.

The U.S. is buying 500 tons of HEU (diluted in Russia to LEU to fuel U.S. reactors) over 20 years, at a cost of about \$12 billion. Here is a threat which will persist for much longer than necessary. It would be a simple matter for the United States and/or the international community to advance Russia the much smaller amount of money required to blend down the remaining 370 tons (and perhaps another 700 tons of HEU not included in this deal) to 19.9% U-235-- thus essentially unusable for nuclear weaponry. This could be done quite readily in about two years, and the money would be repaid by Russia with or without interest at the same time this 19.9% materials (remaining in Russia) was later further blended to the 4% range for transfer to the United States. These funds should come from the G-7.

Weapon-usable materials might be detected in transit. Normal uranium metal is detectable primarily because of gamma rays of near 1 MeV energy, although relatively few are emitted, since the half-life of U-238 is 4.5 billion years. U-235 has a shorter half-life (700 million years) but its decay scheme is far more difficult to detect.

The intense radioactivity of plutonium is largely alpha-particle emission in its decay to U-235. The half-life of 24,000 years means that 6 kg of Pu is about 500 curies. Pu is a serious hazard if inhaled, but has very little external radiation. Nevertheless, appropriate counters detect it at a considerable distance, although it is easier to shield than is U-238.

Weapon uranium is only very weakly radioactive-- with U-235 having a half-life 30,000 times that of plutonium.

There have been many hoaxes in the United States, mostly extortionists demanding money in order not to detonate a nuclear weapon they say is ready to explode someplace in Boston, New York, or elsewhere⁹. To find such emplaced explosives and to disable them, the government created the Nuclear Emergency Search Team (NEST) which now has the ability to deploy about 600 people with appropriate detection and disabling devices.

But a terrorist with a mission actually to kill people would certainly not alert the authorities to the existence of a nuclear explosive. It would need to be detected either following intelligence tips, or by generalized search, or in transit to its emplacement.

This is a tall order for NEST, even granting substantial improvement in their capabilities.

SUMMARY. In looking at a particular terrorist act as involving an actor, an action, and a target, we find that different acts may be impeded in a variety of ways. But there is some generality to the solutions that will reduce terrorism, even though it will not be possible to eliminate it. The U.S. and other states should act to

1. Directly and indirectly to minimize the number of people who wish to become terrorists against us.
2. Move against the actions and to harden targets so that the actor needs more training to carry out the deed.
3. Introduce trusted-person databases and a biometric-based personal identification to reduce the access of un-vetted persons to hazardous areas or hazardous tools.
4. Modify aircraft standards (strengthen cockpit doors) against hijacking; harden freight and private aircraft against unauthorized use.
5. In the bioterrorism area, urgently expand development and production of vaccines, not only in the most highly industrialized states but also in India, for example.
6. Develop and implement in the government and civil economy collective protection by positive-pressure filtered air and filtered circulating air (and masks where desired). Reduction by a factor hundred or even 20 of deaths due to bioterrorism is a worthy goal.
7. Improve security over radioactive sources to reduce the threat of radiological dispersal devices (terrorism by contamination with radioactivity). The cost of adequate security will encourage the substitution of radioactive sources by electron-beam accelerators.
8. Have contingency plans and public education so that people will not move precipitously and dangerously when there would be no significant hazard in remaining in place and living a normal life for a week or more.
9. Replace absolute limits for radiation protection by a market-based approach, in which, for instance, full disclosure and inspection would quantify the increased cancer hazard for a particular home in a contaminated area, and it could be transferred at a market price to people who would on the average be older and have fewer children. Recall that 20% of us will die from cancer. Life is too short for the individual to worry about an additional 1% probability in the remote case of terrorist attack, although it is an important topic in public health.

These partial remedies are not now available, and they will not exist unless the United States creates a technical organization responsible for evaluating the terrorist threat, identifying potential remedies, and evaluating capabilities at any time. This needs to be done with wartime urgency, the same urgency that drove the creation during World War II of the radar lab at MIT and the Manhattan Project for the development of the nuclear weapon. Sections of a small number of existing government or national laboratories might initially be put under the firm control of a homeland-defense analogue of J. Robert Oppenheimer—a person with technical leadership and total dedication to the cause of reducing the vulnerability of society.

A homeland security institute is one of the major recommendations a recent report¹⁰. I was a member of the authoring committee and of its panel on nuclear and radiological issues. The United States is creating a Department of Homeland Security; if headed by a 21st-century counterpart to General Leslie R. Groves of Manhattan Project fame, it could in principle realize some of the near-term remedies advocated here. It could also mount a longer-term program of research and development to reduce the likelihood of

catastrophic terrorism and-in the case of bioweapons and radiological dispersal devices-to reduce the economic and human costs in the event of actual attack. The solution is not in more organization but in ensuring that competent people can do their jobs.

The peril is global; and so should be the response. Vaccine development can proceed in India as well as in the United States. Advances in techniques for cleanup of radioactive contamination can proceed worldwide. Intense sources of radioactivity are present in many countries; an effort led by the IAEA could improve their security against theft. If the resources of the world are to be marshalled for the benefit of humanity, they should not be diverted unnecessarily to countering terrorism. Hence the need for collaboration and efficiency in solving this new and urgent problem.

ENDNOTES

1. This paper is an expanded version of an article to appear in the September 2002 issue of MIT Technology Review, titled "[*The Technology of Megaterror*](#)."
2. Appendix C: BW Agent Characteristics, of USAMRIID's Medical Management of Biological Casualties Handbook, available at <http://www.vnh.org/BIOCASU/26.html>
3. Boeing "free-flight" approach. Also Air Traffic Control Panel Report of the President's Science Advisory Committee, R.L. Garwin, Chairman (1971).
4. At http://www.fas.org/ssp/docs/kelly_testimony_030602.pdf
5. "Megawatts and Megatons: A Turning Point in the Nuclear Age?" by R.L. Garwin and G. Charpak (Alfred A. Knopf, October 2001), pp. 341-342.
6. Extracted from "Management of Terrorist Events Involving Radioactive Material," Table 3.7 on p. 23 of NCRP Report no. 138 of 10/24/01, Recommendations of the National Council on Radiation Protection and Measurements, 7910 Woodmont Avenue, Bethesda, MD 20814-3095.
7. In the "cookie cutter" approximation, assuming that damage beyond the 50% damage expectation contour is equal to the less than total damage within that contour.
8. A set of pages portraying the course of a terrorist nuclear explosion in New York: <http://www.atomicarchive.com/Example/ExampleStart.shtml>
9. "Defusing Nuclear Terror," Bulletin of the Atomic Scientists, March/April 2002, pp. 39-43.
10. "Making the Nation Safer: The Role of Science and Technology in Countering Terrorism" The National Academies Press, Washington, DC, June 25, 2002. (Available at <http://www.nap.edu>).

APPENDIX B: PROLIFERATION SECURITY INITIATIVE: STATEMENT OF PRINCIPLES

Fact Sheet

The White House, Office of the Press Secretary
Washington, DC
September 4, 2003

Proliferation Security Initiative: Statement of Interdiction Principles

The Proliferation Security Initiative (PSI) is a response to the growing challenge posed by the proliferation of weapons of mass destruction (WMD), their delivery systems, and related materials worldwide. The PSI builds on efforts by the international community to prevent proliferation of such items, including existing treaties and regimes. It is consistent with and a step in the implementation of the UN Security Council Presidential Statement of January 1992, which states that the proliferation of all WMD constitutes a threat to international peace and security, and underlines the need for member states of the UN to prevent proliferation. The PSI is also consistent with recent statements of the G8 and the European Union, establishing that more coherent and concerted efforts are needed to prevent the proliferation of WMD, their delivery systems, and related materials. PSI participants are deeply concerned about this threat and of the danger that these items could fall into the hands of terrorists, and are committed to working together to stop the flow of these items to and from states and non-state actors of proliferation concern.

The PSI seeks to involve in some capacity all states that have a stake in nonproliferation and the ability and willingness to take steps to stop the flow of such items at sea, in the air, or on land. The PSI also seeks cooperation from any state whose vessels, flags, ports, territorial waters, airspace, or land might be used for proliferation purposes by states and non-state actors of proliferation concern. The increasingly aggressive efforts by proliferators to stand outside or to circumvent existing nonproliferation norms, and to profit from such trade, requires new and stronger actions by the international community. We look forward to working with all concerned states on measures they are able and willing to take in support of the PSI, as outlined in the following set of "Interdiction Principles."

Interdiction Principles for the Proliferation Security Initiative

PSI participants are committed to the following interdiction principles to establish a more coordinated and effective basis through which to impede and stop shipments of WMD, delivery systems, and related materials flowing to and from states and non-state actors of proliferation concern, consistent with national legal authorities and relevant international law and frameworks, including the UN Security Council. They call on all states concerned with this threat to international peace and security to join in similarly committing to:

1. Undertake effective measures, either alone or in concert with other states, for interdicting the transfer or transport of WMD, their delivery systems, and related materials to and from states and non-state actors of proliferation concern. "States or non-state actors of proliferation concern" generally refers to those countries or entities that the PSI participants involved establish should be subject to interdiction activities because they are engaged in proliferation through: (1) efforts to develop or acquire chemical, biological, or nuclear weapons and associated delivery systems; or (2) transfers (either selling, receiving, or facilitating) of WMD, their delivery systems, or related materials.

2. Adopt streamlined procedures for rapid exchange of relevant information concerning suspected proliferation activity, protecting the confidential character of classified information provided by other states as part of this initiative, dedicate appropriate resources and efforts to interdiction operations and capabilities, and maximize coordination among participants in interdiction efforts.
3. Review and work to strengthen their relevant national legal authorities where necessary to accomplish these objectives, and work to strengthen when necessary relevant international law and frameworks in appropriate ways to support these commitments.
4. Take specific actions in support of interdiction efforts regarding cargoes of WMD, their delivery systems, or related materials, to the extent their national legal authorities permit and consistent with their obligations under international law and frameworks, to include:
 - a. Not to transport or assist in the transport of any such cargoes to or from states or non-state actors of proliferation concern, and not to allow any persons subject to their jurisdiction to do so.
 - b. At their own initiative, or at the request and good cause shown by another state, to take action to board and search any vessel flying their flag in their internal waters or territorial seas, or areas beyond the territorial seas of any other state, that is reasonably suspected of transporting such cargoes to or from states or non-state actors of proliferation concern, and to seize such cargoes that are identified.
 - c. To seriously consider providing consent under the appropriate circumstances to the boarding and searching of its own flag vessels by other states, and to the seizure of such WMD-related cargoes in such vessels that may be identified by such states.
 - d. To take appropriate actions to (1) stop and/or search in their internal waters, territorial seas, or contiguous zones (when declared) vessels that are reasonably suspected of carrying such cargoes to or from states or non-state actors of proliferation concern and to seize such cargoes that are identified; and (2) to enforce conditions on vessels entering or leaving their ports, internal waters or territorial seas that are reasonably suspected of carrying such cargoes, such as requiring that such vessels be subject to boarding, search, and seizure of such cargoes prior to entry.
 - e. At their own initiative or upon the request and good cause shown by another state, to (a) require aircraft that are reasonably suspected of carrying such cargoes to or from states or non-state actors of proliferation concern and that are transiting their airspace to land for inspection and seize any such cargoes that are identified; and/or (b) deny aircraft reasonably suspected of carrying such cargoes transit rights through their airspace in advance of such flights.
 - f. If their ports, airfields, or other facilities are used as transshipment points for shipment of such cargoes to or from states or non-state actors of proliferation concern, to inspect vessels, aircraft, or other modes of transport reasonably suspected of carrying such cargoes, and to seize such cargoes that are identified.

<http://www.state.gov/t/np/rls/fs/23764.htm>

APPENDIX C: UNITED NATIONS SECURITY RESOLUTION 1540

28/04/2004



Press Release SC/8076

Security Council
4956th Meeting (PM)*

Council Resolution

Following is the full text of Security Council resolution 1540 (2004):

"The Security Council,

"Affirming that proliferation of nuclear, chemical and biological weapons, as well as their means of delivery,** constitutes a threat to international peace and security,

"Reaffirming, in this context, the Statement of its President adopted at the Council's meeting at the level of Heads of State and Government on 31 January 1992 (S/23500), including the need for all Member States to fulfil their obligations in relation to arms control and disarmament and to prevent proliferation in all its aspects of all weapons of mass destruction,

"Recalling also that the Statement underlined the need for all Member States to resolve peacefully in accordance with the Charter any problems in that context threatening or disrupting the maintenance of regional and global stability,

"Affirming its resolve to take appropriate and effective actions against any threat to international peace and security caused by the proliferation of nuclear, chemical and biological weapons and their means of delivery, in conformity with its primary responsibilities, as provided for in the United Nations Charter,

"Affirming its support for the multilateral treaties whose aim is to eliminate or prevent the proliferation of nuclear, chemical or biological weapons and the importance for all States parties to these treaties to implement them fully in order to promote international stability,

"Welcoming efforts in this context by multilateral arrangements which contribute to non-proliferation,

"Affirming that prevention of proliferation of nuclear, chemical and biological weapons should not hamper international cooperation in materials, equipment and technology for peaceful purposes while goals of peaceful utilization should not be used as a cover for proliferation,

“Gravely concerned by the threat of terrorism and the risk that non-State actors** such as those identified in the United Nations list established and maintained by the Committee established under Security Council resolution 1267 and those to whom resolution 1373 applies, may acquire, develop, traffic in or use nuclear, chemical and biological weapons and their means of delivery,

“Gravely concerned by the threat of illicit trafficking in nuclear, chemical, or biological weapons and their means of delivery, and related materials,* which adds a new dimension to the issue of proliferation of such weapons and also poses a threat to international peace and security,

“Recognizing the need to enhance coordination of efforts on national, subregional, regional and international levels in order to strengthen a global response to this serious challenge and threat to international security,

“Recognizing that most States have undertaken binding legal obligations under treaties to which they are parties, or have made other commitments aimed at preventing the proliferation of nuclear, chemical or biological weapons, and have taken effective measures to account for, secure and physically protect sensitive materials, such as those required by the Convention on the Physical Protection of Nuclear Materials and those recommended by the IAEA Code of Conduct on the Safety and Security of Radioactive Sources,

“Recognizing further the urgent need for all States to take additional effective measures to prevent the proliferation of nuclear, chemical or biological weapons and their means of delivery,

“Encouraging all Member States to implement fully the disarmament treaties and agreements to which they are party,

“Reaffirming the need to combat by all means, in accordance with the Charter of the United Nations, threats to international peace and security caused by terrorist acts,

“Determined to facilitate henceforth an effective response to global threats in the area of non-proliferation,

“Acting under Chapter VII of the Charter of the United Nations,

“1. Decides that all States shall refrain from providing any form of support to non-State actors that attempt to develop, acquire, manufacture, possess, transport, transfer or use nuclear, chemical or biological weapons and their means of delivery;

“2. Decides also that all States, in accordance with their national procedures, shall adopt and enforce appropriate effective laws which prohibit any non-State actor to manufacture, acquire, possess, develop, transport, transfer or use nuclear, chemical or biological weapons and their means of delivery, in particular for terrorist purposes, as well as attempts to engage in any of the foregoing activities, participate in them as an accomplice, assist or finance them;

“3. Decides also that all States shall take and enforce effective measures to establish domestic controls to prevent the proliferation of nuclear, chemical, or biological weapons and their means of delivery, including by establishing appropriate controls over related materials and to this end shall:

(a) Develop and maintain appropriate effective measures to account for and secure such items in production, use, storage or transport;

(b) Develop and maintain appropriate effective physical protection measures;

(c) Develop and maintain appropriate effective border controls and law enforcement efforts to detect, deter, prevent and combat, including through international cooperation when necessary, the illicit trafficking and brokering in such items in accordance with their national legal authorities and legislation and consistent with international law;

“(d) Establish, develop, review and maintain appropriate effective national export and trans-shipment controls over such items, including appropriate laws and regulations to control export, transit, trans-shipment and re-export and controls on providing funds and services related to such export and trans-shipment such as financing, and transporting that would contribute to proliferation, as well as establishing end-user controls; and establishing and enforcing appropriate criminal or civil penalties for violations of such export control laws and regulations;

“4. *Recognizes* the utility in implementing this resolution of effective national control lists and calls upon all Member States, when necessary, to pursue at the earliest opportunity the development of such lists;

“5. *Recognizes* that some States may require assistance in implementing the provisions of this resolution within their territories and invites States in a position to do so to offer assistance as appropriate in response to specific requests to the States lacking the legal and regulatory infrastructure, implementation experience and/or resources for fulfilling the above provisions;

“6. *Calls upon* all States:

(a) To promote the universal adoption and full implementation, and, where necessary, strengthening of multilateral treaties to which they are parties, whose aim is to prevent the proliferation of nuclear, biological or chemical weapons;

(b) To adopt national rules and regulations, where it has not yet been done, to ensure compliance with their commitments under the key multilateral non-proliferation treaties;

(c) To renew and fulfil their commitment to multilateral cooperation, in particular within the framework of the International Atomic Energy Agency, the Organization for the Prohibition of Chemical Weapons and the Biological and Toxin Weapons Convention, as important means of pursuing and achieving their common objectives in the area of non-proliferation and of promoting international cooperation for peaceful purposes;

(d) To develop appropriate ways to work with and inform industry and the public regarding their obligations under such laws;

“7. *Calls upon* all States to promote dialogue and cooperation on non-proliferation so as to address the threat posed by proliferation of nuclear, chemical, or biological weapons, and their means of delivery;

“8. Further to counter that threat, *calls upon* all States, in accordance with their national legal authorities and legislation and consistent with international law, to take cooperative action to prevent illicit trafficking in nuclear, chemical or biological weapons, their means of delivery, and related materials;

"9. *Decides* to establish, in accordance with rule 28 of its provisional rules of procedure, for a period of no longer than two years, a Committee of the Security Council, consisting of all members of the Council, which will, calling as appropriate on other expertise, report to the Security Council for its examination, on the implementation of this resolution, and to this end calls upon States to present a first report no later than six months from the adoption of this resolution to the Committee on steps they have taken or intend to take to implement this resolution;

"10. *Expresses* its intention to monitor closely the implementation of this resolution and, at the appropriate level, to take further decisions which may be required to this end;

"11. *Decides* that none of the obligations set forth in this resolution shall be interpreted so as to conflict with or alter the rights and obligations of State Parties to the Nuclear Non-Proliferation Treaty, the Chemical Weapons Convention and the Biological and Toxin Weapons Convention or alter the responsibilities of the International Atomic Energy Agency or the Organization for the Prohibition of Chemical Weapons;

"12. *Decides* to remain seized of the matter."

(Individual Country's Statements may be found on UN website listed below)

- The 4955th Meeting was closed

** Definitions for the purpose of this resolution only:

Means of delivery: missiles, rockets and other unmanned systems capable of delivering nuclear, chemical, or biological weapons, that are specially designed for such use.

Non-State actor: individual or entity, not acting under the lawful authority of any State in conducting activities which come within the scope of this resolution.

Related materials: materials, equipment and technology covered by relevant multilateral treaties and arrangements, or included on national control lists, which could be used for the design, development, production or use of nuclear, chemical and biological weapons and their means of delivery.

URL: <http://www.un.org/News/Press/docs/2004/sc8076.doc.htm>

Bibliography

- Ackerman, Jay, and Laura Snyder. "Would They if They Could?" *Bulletin of the Atomic Scientists*, Vol. 58, no.3, (May /June 2002). URL:<http://www.thebulletin.org/article.php?art_ofn=mj02ackerman>. Accessed 16 December 2004.
- Albright, David, Kevin O'Neill, and Corey Hinderstien. "Nuclear Terrorism: the Unthinkable Nightmare." Issue brief delivered to the Institute for Science and International Security, 13 September 2001. URL:<<http://www.isis-online.org/publications/terrorism/nightmare.html>>. Accessed 5 December 2004.
- Boese, Wade. "The Proliferation Security Initiative at a Glance." *Fact Sheet: Arms Control Association*, June 2004. URL:<<http://www.armscontrol.org/factsheets/PSI.asp>>. Accessed 30 December 2004.
- Bolton, John R. Undersecretary for Arms Control and International Security. "An All Out War on Proliferation," *Financial Times*, 7 September 2004, URL:<<http://www.state.gov/t/us/rm/36035.htm>>. Accessed 30 December 2004.
- Bolton, John R., Under Secretary for Arms Control and International Security. "Sea Island and Beyond: Status Report on the Global Partnership Against Weapons of Mass Destruction." Testimony before the Senate Foreign Relations Committee, 15 June 2004. URL:<<http://www.state.gov/t/us/rm/33615.htm>>. Accessed 6 December 2004.
- Boureston, Jack. "Assessing Al Qaeda's WMD Capabilities." *Strategic Insights: Journal for the Center of Contemporary Conflict*, Vol.1, Issue 7, (September 2002). URL:<<http://www.ccc.nps.navy.mil/si/sept02/wmd.asp#references>>. Accessed 10 December 2004.
- Boutwell, Jeffery, Francesco Calogero, and Jack Harris. "Nuclear Terrorism: The Danger of Highly Enriched Uranium." *Pugwash Issue Brief*, Vol. 2, no. 1, September 2002. URL:<<http://www.pugwash.org/publication/pb/sept2002.pdf>>. Accessed 5 December 2004.
- Bowen, Wyn Q. *The Politics of Ballistic Missile Nonproliferation*. New York: St. Martin's Press, 2000.
- Bureau of Nonproliferation. "The G-8 Global Partnership Against the Spread of Weapons and Materials of Mass Destruction." Fact sheet. URL:<<http://www.state.gov/t/np/rls/fs/34967.htm>>. Accessed 5 January 2005.
- Bush, George W. President of the United States. *National Security Strategy of the United States*, 17 September 2002.

- Bush, George W., President of the United States. *National Strategy to Combat Weapons of Mass Destruction*, December 2002.
- Bush, George W. President of the United States. "President Announces New Measures to Counter the Threat of WMD." Speech as given at Fort Lesley J. McNair, National Defense University, 11 February 2004. URL: <<http://whitehouse.gov/news/releases/2004/02/20040211-4.html>>. Accessed 20 December 2004.
- Bush, George W. President of the United States. "Remarks by the President to the Students and Faculty at National Defense University." Speech as delivered to National Defense University, Washington, DC, 1 May 2001. URL: <<http://www.whitehouse.gov/news/releases/2001/05/20010501-10.html>>. Accessed 15 December 2004.
- Center for Counterproliferation Research. *Counterproliferation Imperative: Meeting Tomorrow's Challenges*. Washington, DC. GPO, 2001.
- Center for Strategic and International Studies. *Protecting Against the Spread of Nuclear, Biological, and Chemical Weapons: An Action Agenda for the Global Partnership*. Vol. 1. Washington, DC: The CSIS Press, 2003.
- Civiak, Robert L. "Closing the Gaps: Securing High Enriched Uranium in the Former Soviet Union and Eastern Europe." URL: <www.fas.org/ssp/docs/020500-heu/intro.htm>. Accessed 5 December 2004.
- Cossa, Ralph A. "Multilateralism and Democracy March On, To Many Different Drummers." *Comparative Connections: An E-journal on East Asian Bilateral Relations*, 2nd Quarter 2004. URL: <<http://www.csis.org/pacfor/cc/0402Qoverveiw.html>>. Accessed 30 December 2004.
- Council of Foreign Relations. "Terrorism Questions and Answers." Report updated May 2004. URL: <<http://www.cfrterroism.org/weapons/sarin.html>>. Accessed 10 December 2004.
- Dardrian, Eva. "Sudan: UN Resolutions Continue to be Weak and Meaningless," *Pambazuka News*. 2 December 2004. URL: <<http://www.globalpolicy.org/security/issues/sudan/2004/1202meaningless.htm>>. Accessed 8 January 2005.
- Eisler, Peter. "Fuel For Nuclear Weapons Is More Widely Available." *USA Today*, 26 February 2003. URL: <http://www.usatoday.com/news/world/2003-02-26-nuke-threat-cover_x.htm>. Accessed 28 December 2004.
- Ellis, Susan. "Tenet Says Russian Safeguarding of Nuclear Materials Is a Concern." *USIS Washington File*, 3 February 2000. URL: <<http://www.fas.org/news/russia/2000/000203-rus-usia1.htm>>. Accessed 06 January 2005.

- Ellis, Jason D. "The Gravest Danger: Proliferation, Terrorism and the Bush Doctrine," *The Monitor*, Vol. 9, no.1. Winter/Spring 2003.
- Federation of American Scientist. "The Fissile Missile Cutoff Treaty." URL: <http://www.fas.org/nuke/control/fmct/>. Accessed 28 December 2004.
- Federation of American Scientists. "Weapons of Mass Destruction." URL: <http://www.fas.org/nuke/control/nsg/> accessed 5 January 2005.
- Ferguson, Charles D. "Risks of Civilian Plutonium Programs." brief for the Center of Nonproliferation Studies, July 2004. URL: http://www.nti.org/e_research/e3_52b.html. Accessed 22 December 2004.
- Ferguson, Charles D. and William C. Potter. *The Four faces of Terrorism*. Monterey: Center for Nonproliferation Studies, 2004.
- Foreign and Commonwealth Office. "United Nation Security Council Resolution 1540," *UK Priorities: Terrorism and Security*. URL: <http://www.fco.gov.uk/servelet/font?pagename=openmarket/xcelerate/showpage&c=page&cid=1096637816227> Accessed 8 January 2005.
- Gertz, Bill. "British Reports Links to Al-Qaeda, Baghdad." *Washington Times*, 15 June 2004. URL: <http://www.washtimes.com/national/20040715-121130-6893r.htm>. Accessed 5 January 2005.
- Global Security.Org. "Proliferation Security Initiative." URL: <http://www.globalsecurity.org/military/ops/psi.htm>. Accessed 17 December 2004.
- Hoffman, Bruce. *Inside Terrorism*. New York: Columbia University Press, 1998.
- Hussain, Syed Talat, and Adam Zargorin. "Bordering on Nukes." *Time*, 22 November, 2004. URL: <http://www.time.com/time/archive/preview/0,10987,995684,00.html>. Accessed 9 December 2004.
- "Jordan Foiled Al-Qaeda Chemical Attacks." *World News, Agence France-Presse*, 27 April 2004. URL: http://www.inq7.net/wnw/2004/apr/28/wnw_1-1.htm. Accessed 12 December, 2004.
- Joseph, Robert G. "Countering Weapons of Mass Destruction in the New National Security Strategy." *The Monitor*, Vol. 9, no. 1, Winter/Spring 2003. Athens: Center for International Trade and Security.
- Kraus, Don. "The Need for UN Police," *Foreign Policy in Focus: A Think Tank Without Walls*. 5 June 2003. URL: <http://www.globalpolicy.org/security/peacekeeping/reform/2003/0605police.htm>. Accessed 8 January 2005.

- Miller, Marvin M. Department of Nuclear Engineering Massachusetts Institute of Technology. "Are IAEA Safeguards on Plutonium Bulk-Handling Facilities Effective?" *The Nuclear Control Institute*, August 1990. URL: <<http://www.nci.org/nuketerror.htm>>. Accessed 10 December 2004.
- National Commission on Terrorism. "Countering the Threat of International Terrorism." URL:<<http://www.fas.org/irp/threat/commission.html>>. Accessed 15 November 2004.
- National Intelligence Council. "Annual Report to Congress on the Safety and Security of the Russian Nuclear Facilities and Military Forces." February 2002. URL:<http://www.cia.gov/nic/special_russiannucfac.html>. Accessed 17 December 2004.
- "NATO Simulates Al-Qaeda Nuclear Attack." *Associated Press*, 4 May 2004. URL:<<http://www.foxnews.com/story/0,2933,118975,00.html>>. Accessed 19 December, 2004.
- Nuclear Control Institute. "IAEA's Acknowledgement of Nuclear Terrorism Risk is Welcome but Long Overdue." Press release 1 November 2001. URL: <www.nci.org/01nci/10/iaea-ackn.htm>. Accessed 20 December 2004.
- Physicians for Social Responsibility. "Reducing the Threat of Nuclear Terrorism: Nonproliferation Efforts in the U. S. State Department." Issue brief, August 2002. URL:<http://www.psr.org/home.cfm?id=dos_brief>. Accessed 10 December 2004.
- Prosser, Andrew and Herbert Scoville Jr., *The Proliferation Security Initiative in Perspective*. 16 June 2004. URL:<<http://www.cdi.org/pdfs/psi.pdf>>. Accessed 7 January 2005.
- Schram, Martin. *Avoiding Armageddon: Our Future, Our Choice*. New York: Basic Books, 2003.
- Semmel, Andrew K. Principle Deputy Assistant Secretary of State for Nonproliferation. "US Perspective on UN Security Council Resolution 1540." Speech presented to Asia Pacific Nuclear Safeguards and Security Conference, 8 November 2004. URL: <<http://www.state.gov/t/np/rls/rm/38256.html>>. Accessed 3 January 2005.
- Spring, Baker. "International Smuggling Networks: Weapons of Mass Destruction Counterproliferation Initiatives." Testimony to Senate Committee on Governmental Affairs, 23 June 2004. URL:<<http://www.hertiage.org/research/missiledefense/tst081104b.cfm>>. Accessed 29 December 2004.

- Tikhonov, Valentin. *Russia's Nuclear and Missile Complex: the Human Factor in Proliferation*, online edition. Washington DC: Carnegie Endowment for International Peace, 2001. RL:<<http://www.carnegieendowment.org/publications/index.cfm?fa=view&id=656>>. Accessed 08 January 2005.
- United Nations Security Council. "Security Council Decides All States Shall Act to Prevent Proliferation of Mass Destruction Weapons." Press release SC/8076 28 April 2004. URL:<<http://www.un.org/News/press/docs/2004/sc8076.doc.htm>>. Accessed 5 January 2005.
- United States Congress. *Global Proliferation of Weapons of Mass Destruction: A Case Study on the Aum Shinrikyo*. Senate Government Affairs Permanent Subcommittee on Investigations, 31 October 1995. URL:<http://www.fas.org/irp/congress/1995_rpt/aum/>. Accessed 11 November 2004.
- Weiser, Benjamin. "U.S. Says Bin Laden Aide Tried to Get Nuclear Weapons." *New York Times*, 26 September 1998.
- Zangger Committee. URL:<<http://www.zanggercommittee.org/Zangger/default.htm>>. Accessed 4 January 2005.